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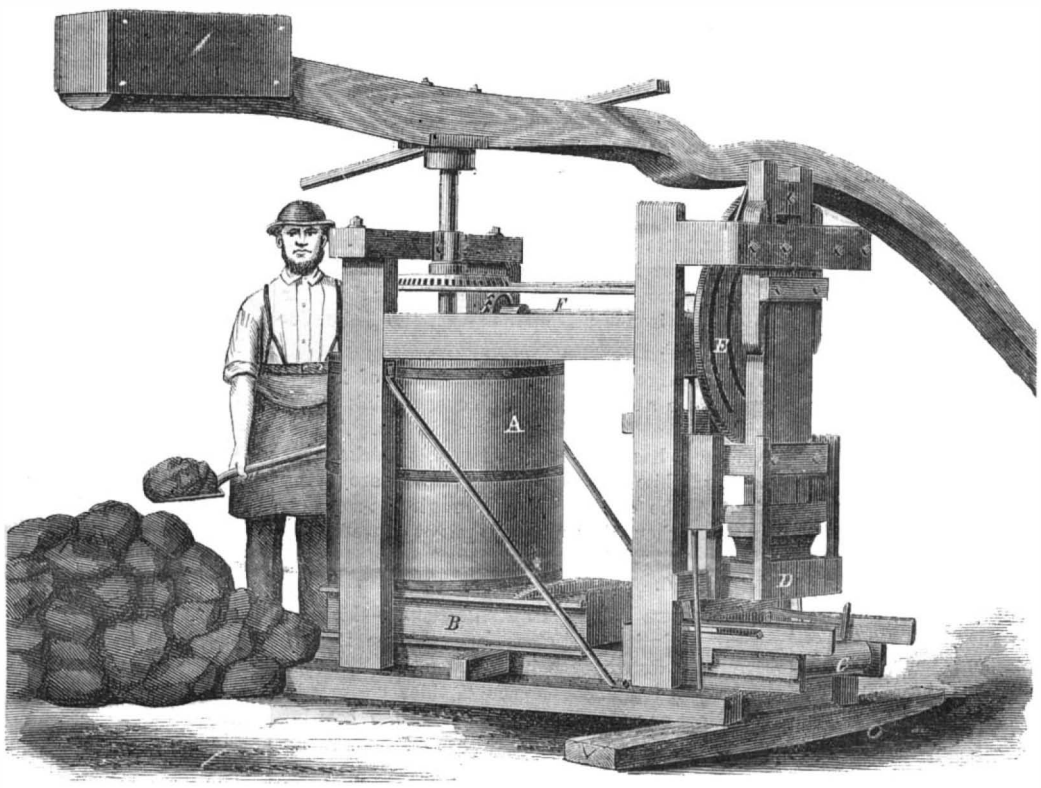
Improved Brick Machine.

The engraving herewith presented is a perspective view of an improved brick machine, which, with two horses, three men, and a boy, makes 18,000 bricks per day, five at a time, and ten every revolution. With the power of a single horse it makes 20 feet of perfect drain tile per minute.

The vessel, A, in the engraving contains a vertical shaft, which has a series of horizontal radial arms, which, by the revolution of the shaft, thoroughly mix and knead the clay. To the lower end of the vertical shaft is attached a scraper, which delivers, through an opening in the side of the vessel, A, at its bottom, the clay, to another scraper operating under the platform, B, which deposits the material on an endless apron passing over the roller, C. By this apron the clay is brought to the molds, D, in front of the machine, which are raised and lowered by cam-shaped openings in the disk, E, rotated by means of the shaft, F, gearing into the vertical shaft. The lower edges of the divisions forming the molds are sufficiently sharp to divide the clay readily. The followers which traverse between the divisions of the molds are also operated by the disk, E, and press the clay firmly in the molds, when follower and molds together are raised, leaving the brick on the endless apron. A simple device (not represented) delivers the bricks ready for drying.



WOLLISTON'S BRICK MACHINE.

It is difficult fully to describe the operation of this machine without detailed drawings, but enough can be seen to give practical brickmakers an adequate idea of the improvement. Its rapidity of operation —making two sets of bricks at each revolution of the cam disk—its portability, the thorough mixing of the clay, and the excellent quality of the product, all seem to recommend this machine as one efficient for the work designed.

Patented through the Scientific American Patent Agency June 5, 1866. Manufactured by Ferrell, Ludlow & Co., Springfield, Ohio, to whom all orders should be addressed.

ON FLYING MACHINES.

Mr. F. H. Wenham lately read a paper before the Aeronautical Society of Great Britain, entitled "Some Observations on Aerial Locomotion, and the Laws by which Heavy Bodies impelled through the air are sustained," of which the following is an abstract :—

The author commenced by stating that a great amount of power is required to raise a weight perpendicularly in a still atmosphere, on account of the yielding nature of the support. To compensate for this a very large surface would be requisite, and to enable a man to raise his own weight, together with the machine (assumed at 300 lbs.) by his individual strength, about 1,000,000 square feet would be necessary, which of course places the size of the apparatus beyond the range of practicable construction. As the sustaining surface is diminished, so must the power be increased. If the surface is reduced down to the ratio of one square foot for each pound to be raised (being about the average ratio of weight to wing surfaces in birds) it will require a power of twelve horses to raise a weight of 300 lbs. perpendicularly on still air. In the paper some experiments are quoted, which show that a force of from three to four horse-power is required for each 100 lbs. raised in the atmosphere by means of a screw or windmill, rotating with its axis set vertically, and the author concludes from these experiments that any machine constructed on this principle, for raising or transporting heavy bodies, must end in failure, as we have no continuous motive power sufficiently light even to support its own weight.

The author next makes some observations on the flight and wings of birds, and points out that endurance of flight and sustaining power, when the bird is traveling rapidly through the atmosphere, is not dependent upon large surface, but on great length of wing, and among other examples mentions the albatross, whose endurance of flight is so great that in stormy weather it never rests on the water. The wings of this bird extend 14 feet from end to end, and only measure 10 inches across the broadest part; the sustaining effect is consequently obtained upon a very wide stratum of air, at a speed of 30 miles per hour. Taking this stratum at one foot thick it will weigh upwards of one hundred times as much as the body of the bird, and as the wings are constantly cutting into a fresh body of air with its inertia undisturbed, it affords a nearly solid support, even when the plane of the wings is set edgewise and parallel to the line of motion. Under these conditions the flight of the bird is performed with a less expenditure of power than by any other mode of animal locomotion taken at a similar speed.

In confirmation of this theory, the author alludes to the lee-boards and sliding-keels of vessels of shallow draught which counteract lee-way and enable the vessel to carry a very heavy press of sail, so great is the resistance they meet against the rapidly passing body of water. If a thin lath of wood is held perpendicularly, and moved rapidly to and fro, with its plane at right angles to the direction of a running stream, a very great increase of resistance will be felt; and if the lath is fixed centrally, with its plane at right angles at the end of a rod, on immersing this in a stream, the resistance measured will be simply that due to the flat superficies of the blade; but if the rod, held in the direction of the stream, is now put into rapid rotation, the resistance will be equal to the area of the entire circle of revolution, and it is found that the more rapid the motion the narrower may be the blade to give the maximum resistance.

The author then relates some experiments tried with screw propelers, applied to a small steamboat, in order to corroborate this theory.

When the boat was moored fast, with the engine running at its utmost speed, but very little tractive effort was indicated, as nearly all the power was consumed in "slip," or in giving motion to a yielding body of water; but the boat was allowed to run onward, and the screw to find an abutment on a fresh body of water having its inertiaun disturbed; it acted almost as if in a solid nut, the slip being only 11 per cent, and the tractive power at its maximum. The author, after having given many other reasons for showing that the supporting effect of long and narrow planes moved edgewise through elastic and yielding media depends upon the width of stratum, and consequently the weight of material passed over in a given time, proceeds to consider how this principle may be applied to machines for sustaining weights on a support of air. If the proportions of surface and length of wing are taken from examples of the easiest flying birds, in order to sustain the weight of a man and the attachments, the wings must extend out 60 feet from end to end and be near four feet broad. This will at once show that such an arrangement would be utterly impracticable, and that no flying machine can ever be constructed in imitation of the natural wings of a bird. A spar or pinion 30 feet long must be very thick and heavy to bear the total amount of weight to be sustained, its forward edge would also cause great atmospheric resistance, needing more power than could well be spared for flight, and this cumbrous extent of wing would be productive of accident from contrary currents of wind near the earth's surface. The author shows that great length of wing is an absolute condition for performing flight with the least possible amount of mechanical force, and consequently that no machine can be successful if carried out in exact imitation of the wings of flying animals. But from the simple fact that a dozen pelicans, each weighing 21 lbs., may fly exactly one above the other without mutual impediment, as if framed in one, it may be seen that a weight of 250 lbs. may be supported in

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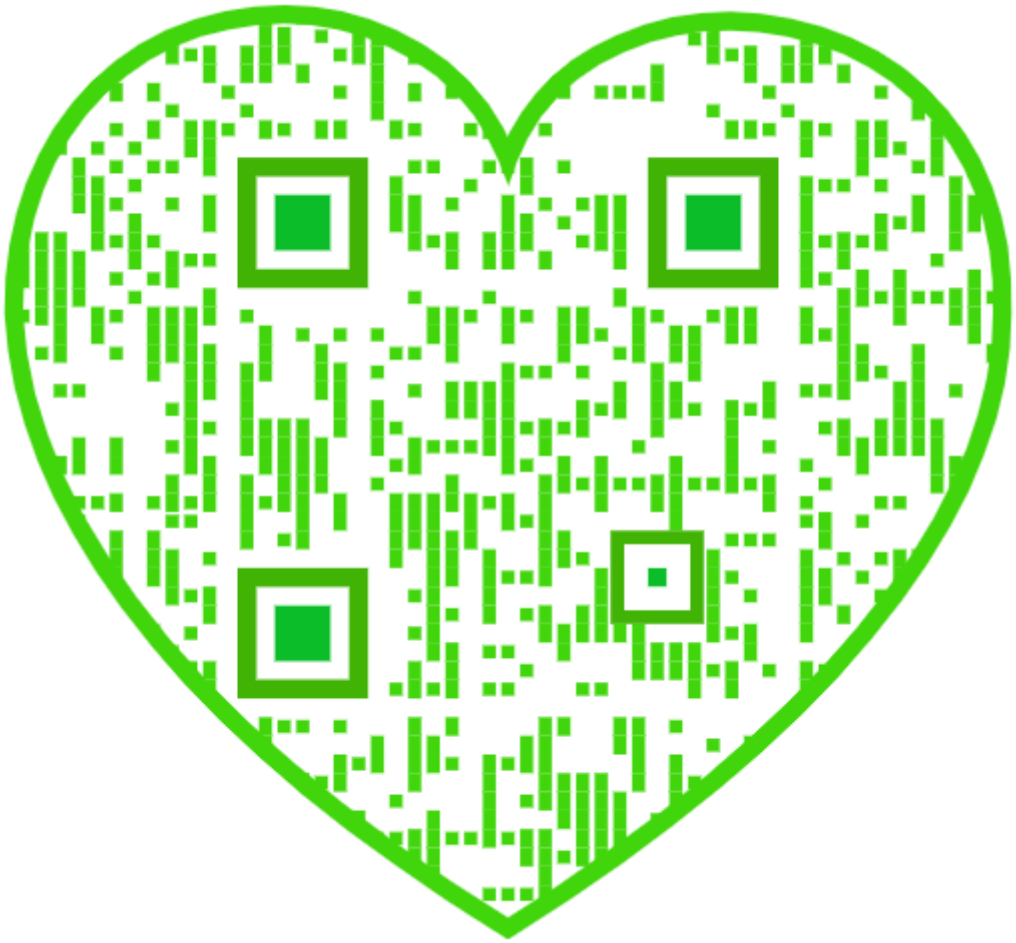

a transverse distance of only 10 feet, or the extent of the wings of a single bird. On this principle various models were made, all of which, when held in a breeze, gave great supporting power for their size. The sustaining effect was found to be the same whether the planes were extended in one length, or superposed. A model was then constructed of sufficient size to raise the weight of a man. The plane surface was 18 inches broad, and consists of webs of thin holland stretched in a frame. The length of fabric was 90 feet, but, instead of extending in one length it was cut into five pieces, which were arranged equidistantly, one above the other, in parallel planes ; the whole weighed about 45 lbs. This contrivance, when held against a breeze estimated at about twenty miles an hour, easily raised the experimenter, but not being provided with any propelling arrangement it quickly descended again, with no worse accident than the fracture of the apparatus. For the last six years other pursuits have prevented the author from continuing these investigations, and till very recently nothing further has been done. Experiments are now in progress for the purpose of ascertaining the force required to propel a series of superposed aerophanes through the atmosphere, at speeds exceeding twenty miles per hour. Should this prove to be within the compass of manual power, there is some probability that an active man might be enabled to perform extended flights, as the system of fixed wings or aerophanes may be very light, and at the same time abundantly strong for sustaining weights. An arrangement of planes, fitted together within the last few days for the purpose of experimenting, weighs about 40 lbs., and will bear a load of 3 cwt. with safety. The planes extend 10 feet from end to end, and there is a series of h:min hight, with an interval of 8 inches between them. At a speed of thirty miles per hour, six tuns of air per minute will pass through the apparatus, which will give great supporting power, by running on a stratum of this weight.—*Mechanics' Magazine.*

MISCELLANEOUS SUMMARY.

A scientific way of lighting pipes and cigars has been recently introduced in Paris under the name of *poudre de feu.* It consists of pyrophorous, which is preserved in a small tin case with narrow orifice. When a little of this black powder is poured out on the end of a cigar, or on the tobacco in a pipe stem, and then gently breathed upon, it becomes incandescent, and is in a condition to light said pipe or cigar. What next? Why, there are little tubes sold containing pellets of potassium, and they are recommended to the juvenile Parisians as a means of forming splendid Gregorian fireworks on any convenient piece of water! Could Sir H. Davy see this he would be as much astonished as we should in seeing him.

THE Chicopee Manufacturing Company used during the year just closed, 5,872 bales of cotton, and made 9,007,325 yards of goods. The revenue tax of 6 per cent on sales amounted to $110,863 36, or 26 per cent of the capital stock. Dividends of 45 per cent have been paid during the year. The company have purchased the water power of the Massachusetts Arms Company, at Chicopee Falls, adding a 15,000 spindle power to that previously owned by them.

CHEAP YELLOW GLASS FOR OPERATING ROOMS.—To some thick spirit varnish add a small quantity of iodine sufficient to render the varnish of the requisite deep color. When a glass is warmed, and a coating of the varnish applied, it will be found to be beautifully transparent. In the case of a globe for a lamp or gas it should be warmed, and a little of the varnish poured in and turned round before a fire till properly covered.

THERE are at present twenty-five grain-elevating warehouses in Buffalo, having a storage capacity of 5,495,000 bushels and a transfer capacity per day, of 2,616,000 bushels. Statistics show that more grain is handled at Buffalo than any other one point, not excepting Chicago.

THE manufacture of paper is about to commence in Oregon city. The machinery is on the ground and buildings are now in progress.

BUTTER MAKING.—A machine for making butter, just announced among the new inventions in the English Patent Office, consists of a movable metal cylinder suspendod from a small cast-iron frame. The bottom of the cylinder is a loose piece of galvanized iron, and above this it is perforated by a number of small holes. This cylinder is suspended in a bowl of water, and the cream is placed in the cylinder and pressed by a screw piston, the result of which is that the butter is forced through the holes into the water, in the shape of vermicelli. By this means all the buttermilk is excluded, and the butter is found to be much closer and sweeter than when made by hand.

[It is not very clear how this excludes the buttermilk.—EDS.

TUNNELING THE MISSISSIPPI.—The project of bridging the "Father of Waters," at St. Louis, has met with such strenuous objections that it has been abandoned, and the railroad companies, whose roads center there, have conceived the idea of tunneling the river. Consent to construct the work will be asked of Congress, and as soon as it is obtained, it is proposed to begin the work. The cost is estimated at $3,000,000, and the time required for the completion of the work three years. The tunnel will not be more than three-fourths of a mile long.

IN 1860, there was not a furnace or rolling-mill nor forge nor foundery in Cleaveland ; now there are twenty-one, having an aggregate capital of $3,000,000, an aggregate capacity of 60,000 tuns per year, giving employment to 3,000 men, whose total wages last year, were $1,080,000. There are in process of erection other iron and steel works which will increase the product nearly one quarter for the year 1866. The iron is all obtained from the Lake Superior mines.

AN exchange says that when a piece of iron is thrown into a trough where chickens drink water they are not affected with chicken cholera. A gentleman who has tried it, says that his chickens are thriving, while those of his neighbors are dying daily. As the chicken cholera is raging to some extent throughout the country, it might be well to try it. Iron will not hurt fowls, and a trial of it might be beneficial.

TO RENDER WOOD UNINFLAMMABLE.—Make a saturated solution of potash, and thicken it with paste as for distemper painting, then add sufficient clay to give it the consistence of thick cream, adding yellow or red ocher or other mineral coloring matter, if desired, for the sake of appearance. Wood painted with this composition is said to be proof against rain, and to be incapable of being inflamed, although it may be carbonized by a fierce heat.

THE Government authorities at Cologne have issued a circular cautioning the public against variegated slate pencils. Schweinfort green, which contains arsenic, is used for the green, chromate of lead for the yellow, and red lead for the red varieties. The circular points out the danger of this practice, especially to children, by whom slate pencils are chiefly used.

DURING five years ending with 1861, the carrying trade of New York amounted to $1,644,000,000, over 1,000,000,000 of which was done under the American flag. In the four years which followed, out of the 1,700,000,000 of foreign trade of the city of New York, 1,300,000,000 was carried under foreign flags.

THERE are in the United States about nine hundred railroad corporations that operate steam-power roads; the joint length of the steam-power roads in the United States is about 32,000 miles, and their joint cost is about $1,280,000,000—equal to an average of $40,000 for each mile.

ENGLISH locomotive builders have adopted a method long in use on marine engines for fitting up certain connections. On the parallel rods of locomotives they use a solid bush instead of the usual box, and gib, and key. When the bushes are worn out others are supplied. This plan has been introduced on the New Jersey Railroad, and makes a very neat-looking piece of work.

THE burnt district in Portland has been accurately surveyed, and found to cover an area of three hundred and twenty-seven acres.

IT is said that Mr. Gale, the discoverer of the process of rendering gunpowder non-explosive, has invented a contrivance for increasing the velocity of discharges from fire-arms. It consists of a longitudinal piece of steel, perforated for bullets, and fitting into a pistol between the stock and the barrel at right angles to the weapon. It is worked by the action of the lock and traverses a certain distance after each discharge. The device is not new. We saw it successfully applied by E. C. C. Kellogg, in Hartford, several years ago, to a rifle barrel mounted on a carriage.

THE sugar house of John B. Brown & Sons, at Portland, consumed in the recent fire, was one of the largest in the United States. The property burned was valued at $700,000, on which there was insurance for about half the amount. This was one of the few establishments in the country in which refined sugar and sirup are made from molasses. The process is a secret very little known. It has been for many years a flourishing trade in Portland, conducted principally with the island of Cuba, and especially with Cardenas. Nearly four million gallons of molasses were consumed at this sugar house in one year. The works are to be rebuilt.

THE Beet Sugar Manufacturing Company, at Chatsworth, Ill., have six hundred acres of beets growing this year. They estimate the crop at ten tuns to the acre, which would yield full one million pounds of sugar. The machinery of the company is all new, was brought from Germany, and is in the most perfect order. They will commence operations about the first of October. If this enterprise proves a success—of which there is not much doubt—the business will be sure to spread with rapidity through that State and the Northwest.

THE Italian Government has given orders for the manufacture of cuirasses of aluminum for their cavalry regiments. A series of experiments made under various conditions demonstrate that a cuirass of this metal, while possessing the great advantage of being as light as a coat, cannot be pierced by a musket ball at the distance of forty paces, nor by the thrust of a bayonet. The war, however, so far as Victor Emanuel is concerned, having come to a sudden end, we presume he will not spend his money on aluminum cuirasses.

The Pittsburg *Price Current* has seen a certificate allowing the use of steam of 183 lbs. per square inch, in a boiler that has been proved to the enormous pressure of 270 lbs. The boiler was built to test thoroughly the economy of high-pressure steam, five times expanded. The initial steam in the cylinder is intended to be 165 lbs. per square inch, and 40 indicated horse-power is calculated upon being realized with 60 lbs. of combustible per hour, or 1·5 lbs. per hour per horse-power.

FLY KILLER.—We have tried a great many plans to get rid of flies, but none has proved so effective as the fly paper made by Peck & Nash, of Bridgeport, Conn. A piece of this paper placed in a plate containing water, will invite the flies to a death banquet.

AT Lazell, Perkins & Co.'s works, at Bridgewater, Mass., a mold is being made for casting a monster sea water condenser for one of the Boston and Liverpool packets now being built at Newburyport. It will require twenty tuns of iron, and will be the heaviest single casting ever turned out by these works.

THE bricklayers of Memphis have struck work. They ask an advance of wages which will amount to seven dollars per day. The strike will have the effect of putting a stop, for a time at least, to many of the buildings now in course of erection in that city.

THE Michigan Central Railroad uses, and has fully tested and proved, the superiority of the six-wheel truck instead of four commonly used, and that in all casualties happening upon the road, no passenger inside of a car has been injured.

THE exports from the port of New York, for five months ending May 1, 1865, amounted to $127,367,973, of which sum $29,891,174 was in specie and bullion. The imports amounted to $140,666,379—leaving a balance against us of $13,298,406. Our tariff is now very high, yet we find a large party clamoring for free trade

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THE CHILDREN OF MECHANICS.

The home is the center of human happiness, so far as happiness concerns our brief earthly life. Any thing that destroys home is inimical to happiness. Home, comprising wife, children, friends, with the domestic castle, is essential to the proper development of the best qualities of our nature and to the well being of all who have the least amount of civilized human feeling. The influences of home, more than the state of the market, the rate of wages, the condition of business, affect the workman. He can withstand the lowering of the price of his productions, the temporary depression of profits in his business, or the unforeseen fluctuations of the market, if he is sustained by the influences of home, and if he can be assured that his children can avail themselves of advantages which will enable them to retain their position and provide for themselves and those dependent upon them when he shall have left them. Then the future is humanly secure—for the present he can provide.

But what if there is a perpetual struggle at the present, with a gloomy uncertainty of the future. The man is deprived of all his vigor of mind, his enterprise, his pride. Yet such is the condition of thousands of industrious men in England. A correspondent of the *Pall Mall Gazette*, who has visited some of the iron furnaces in the "black country" of Staffordshire and Worcestershire says:—

In the mills and forges boys of all ages, from eight and upward, may be found, amid the labyrinth of machinery and the coils of heated iron, engaged by day and night in tugging long, red-hot seething bars. Their activity is very great, owing to the nature of their work, which requires rapidity of movement, and contrasts strangely with their otherwise jaded and worn appearance. In addition to the labor of dragging along the iron, each of these little fellows has to run, in short stages, a distance of more than eleven miles every day, in an oppressive atmosphere, thick with dust and steam. Owing to the quick and uncertain movements of the hot iron bars in their passage through successive rolls before having time to cool, the occupation of these boys is attended with some danger—a serious burn being an almost every-day occurrence.

Standing in the midst of an extensive forge, a few years ago, I was alarmed by a cry of terror at the further end of the works. There was a general rush to the spot, and I shall never forget the horrible and sickening sight that met our view. A large rod of seething iron, in coming from the rolls, had somehow twisted aside, and had literally pierced through the body of a little fellow some ten years old. For a while the roar of the machinery was suspended, and two or three brawny puddlers carried the hapless creature home; but when the first thrill of horror had passed away the wheels were again set in motion and all went on as before.

The lives of these boys are almost entirely spent in the forges, except the hours allotted to sleep. They have their meals there, and in the snatches of leisure it is their play-ground. In most of the works is the arm or basin of a canal, the water of which is kept in a state of chronic fever, and in which, despite its inky color, they delight to bathe, both in winter and summer. So constant are they in their ablutions that they often come out parboiled, like a washerwoman's thumb. Some of the proprietors of these works have provided night schools for the instruction of the children in their employ; but, as a rule, they are in mind and body alike neglected, and the densest ignorance prevails. They have no home training, most of their houses being locked up all day, the parents and all the children being out at work; and returning home fatigued at night, nothing but bed or a carousal in the "Fox and Dragon" is acceptable.

Returning home late one evening, I saw two little children, a boy and girl, lying asleep upon a door step, which proved to be that of their own home. On awaking them they told me that they were waiting for their mother to come out of the neighboring tavern, and open the door. They had no father and had been hard at work all day. The boy worked in a forge, the girl in a foundery, and the mother in a japanning factory, and though thus separated all day, there seemed no bond of affection to bind them when they met together.

In such a state of affairs there can be no legitimate home influences. The father and mother, all the children whose infantile strength can be utilized, are employed at hard labor, day after day, and week after week, too wearied, after performing their allotted task, to exert themselves to make home happy. Life to them is an endless and exacting treadmill. The gentler virtues, which give a charm to feminine character, make childhood loveable, and civilize and elevate coarse, masculine humanity, cannot grow in such sterile soil. What do our mechanics think of such an exhibit as the following:

West of Dudley is a strange wild region known as the "nailing district," composed of scattered hamlets, to all the houses of which is attached what appears to the stranger a blacksmith's shop. The manufacture of wrought nails is, and has been for a century or more, the great staple industry of the district. It is carried on by the nailers in their own houses. In few trades of the district does the employment of women and young children assume a more objectionable form than in this. The women seem to have lost all traces of the modesty of their sex, and from childhood are addicted to swearing and smoking—resembling as far as possible the other sex in their habits and deportment even to the wearing of their coarse flannel jackets. They mostly marry very young, often at fourteen, and seldom later than eighteen or twenty. With such women for mothers, it is not difficult to judge of their children. From tenderest ages, often from five or six years, they are trained to that round of labor in which their lives are doomed to be spent. The first stage is "blowing the bellows," and next they are taught to forge the smaller kinds of nails.

The hours of labor are dreadfully prolonged, often exceeding sixteen hours per day; the rate of remuneration is very low, and the houses are consequently wretchedly poor. Entering one of them lately, I saw the father, mother, and eight sons and daughters, all toiling in a small ill-ventilated dirty hovel. It was growing late in the evening, and I inquired, "Is it not time to cease your day's work?" "Oh, noa maister," rejoined the mother; "we've a noit's work afore us yet, or there'll be no bread o' the loaf o' Sunday." It was Friday night, and it was, as I learnt, a practice to work from Friday morning until Saturday afternoon, without having more than short snatches of rest for meals. While I lingered, a little fellow, who could not have been more than eight, fell from his work, apparently exhausted, but his father, on observing it, threw at him a hammer handle, telling him with an oath, to recommence his work. He took no part in our conversation, having, like his two eldest daughters, a short pipe in his mouth, which seemed to him and them "the calumet of peace."

American mechanics and laborers should feel grateful that neither they nor their children are consigned to such a hopeless and dismal slavery as this. The child of an American mechanic is treated as a child until it has assumed the virility of manhood. Home influences, schools, good air, God's glorious sunlight, and freedom, educate the child into a character above that of a human brute. These influences are absolutely necessary to the development of a rounded, manly character. Home is the primary school for such education, and when it cannot exist with a proper provision for its inmates, it is proof positive "there is something rotten in Denmark."

[For the Scientific American.]

THE STEAM ENGINE INDICATOR.

Perhaps nothing connected with steam engineering of such acknowledged importance receives so little attention among builders and owners of steam engines. Its use to the constructing engineer is of the most vital importance. Without it he works in the dark. His engine may be well and properly proportioned, yet hidden defects may exist in the steam passages by the falling or washing of cores which reduces or distorts the passages, yet are not easily detected by the eye.

The writer remembers during a somewhat extended experience many instances of this. In two cases he has found the exhaust passages entirely closed, and yet it was not detected until the engine had steam on it and an attempt was made to have it move. Other cases have come under his notice where the passages have been but partially closed—here the indicator reveals it at once. The writer knew of an engine 16×40 inches made by a popular firm for a party to put in a large building for the purpose of supplying power to tenants. The machine was got up with great care from new patterns, and being in a good location to show, it was intended as a model engine by the makers.

It proved to be, however, a very expensive machine to run. New and improved boilers were put in but without materially reducing the amount of fuel consumed. The engine was overhauled repeatedly by the makers, who did everything within their knowledge to improve it, but without effect. The power generated cost too much. The landlord lost money and failed; the same result followed his successors, and finally the engine was thrown out and its place supplied by another with good results to the owner of the property.

The old engine was offered for sale, and sold to go in an armory in an adjoining State. It was overhauled and put in good condition so far as could be seen, and put at work, but with the same result—a large consumption of fuel for the power available. After all other expedients had failed, the indicator was applied, when it was found that with an initial pressure of 60 pounds there was a back pressure of 15 pounds! Here, then, was revealed the cause of the trouble. On examination, the exhaust passage was found obstructed; the cores had not met properly, and the exhaust steam had to pass through an aperture of about a square inch in area. On cutting through the side pipe and removing the slight obstruction the engine performed a duty due to the fuel consumed.

On another point of great importance to the well working of the steam engine the indicator is invaluable—the setting of valves. Most engineers think they can set their valves by the eye, but an experience, somewhat extended, with the indicator has shown the writer that as a rule this is a fallacy; valves have to be set by the eye when the engine is not under steam, hence the expansion, the springing of the various parts, which cannot with certainty be ascertained, consequently it is seldom that they are right. The indicator, then, is the only way known by which valves can be perfectly adjusted.

Until the year 1862, the instrument in use previous could not be used on engines of quick motions with any satisfactory result. At the great exhibition of that year, in London, an indicaton was exhibited, invented by Mr. Charles B. Richards, of Hartford, Conn., by which diagrams, correct and entirely reliable, are taken under any attainable speed; hence locomotives and any other quick-running engines are indicated with equal accuracy as the large slow-moving marine engine.

Another important fact is proved by the indicator—the exact amount of power exerted by the engine; this, compared with the fuel consumed, enables the engineer to compute with exactness the cost per horse-power, also the quantity of power used for certain work or by different tenants. About this there is no guess-work; it is absolutely weighed and measured.

The custom of renting power by a belt of given width and velocity is fallacious. It is easy to tell what power a belt should transmit, yet it is utterly impossible to tell how much it will transmit; so many contingencies arise, some of which follow the quality and condition of the belt, the condition of the pulleys, the amount of contact with pulleys, the position—whether vertical, horizontal, or diagonal; which side is the draft on; whether the grain or flesh side is in contact with the pulley, the tension, the condition of the atmosphere, etc. The only reliable mode is to measure the work by the indicator. By it we can ascertain the comparative value of different kinds of fuel, also of lubricants, the ability and faithfulness of the engineer and fireman. In fine, all elements which assist in making and using steam efficaciously and economically.

F. W. B.

LARGE INDIA-RUBBER BALL VALVE.—Some india-rubber ball valves, five inches in diameter, have recently been manufactured by the New York Belting and Packing Company. These are the largest valves of the kind made in this country, and are preferable to brass by reason of their noiseless action, uniform tightness, and lightness.

THE Secretary of the Treasury, upon a question submitted to him, has decided that iron, whether imported or domestic, to be used in the construction of steam boilers for vessels, must be stamped in the manner required by law, otherwise the makers or users will be subject to a penalty.

It is stated that the method of protecting gunpowder by mixing it with ground glass, patented in England by Mr. Gale, is of no practical utility, as the sharp particles of the glass cut the grains of the powder and reduce it to meal in the process of separating the two substances. This report lately appeared in a foreign journal.

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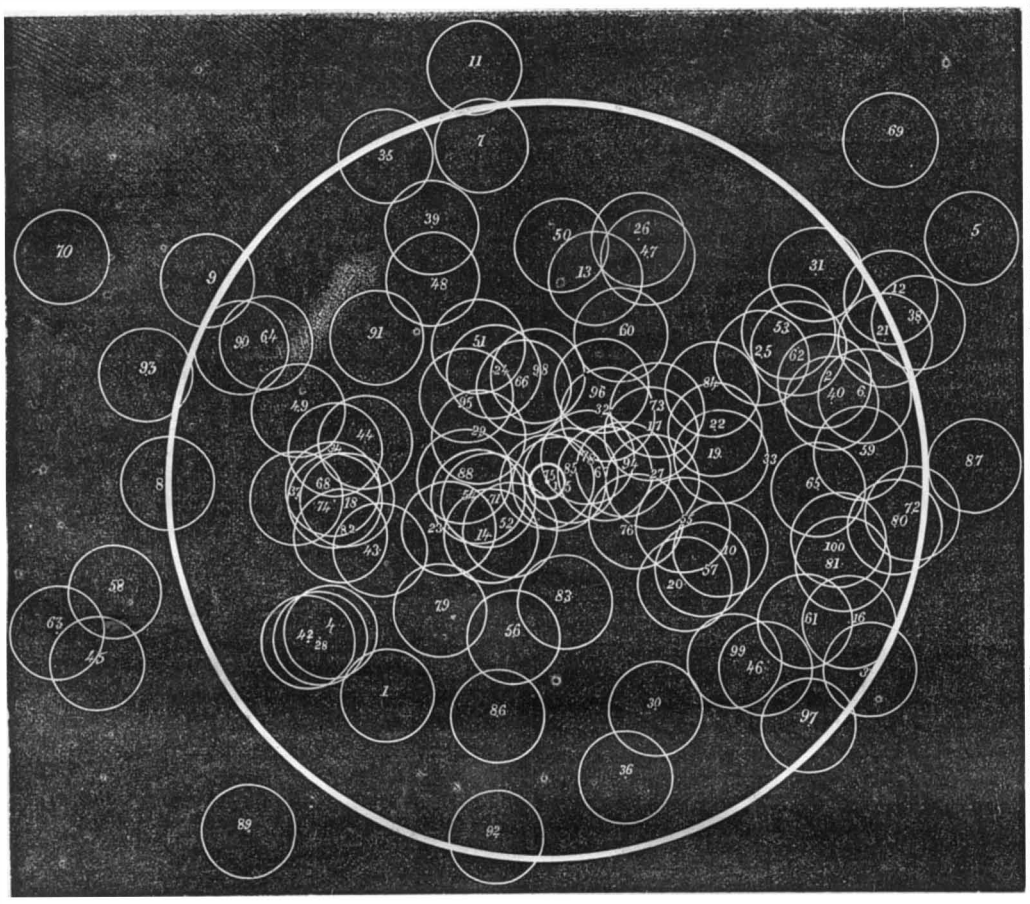
Rifle Shooting.

Mr. L. H. Simmonds, of San Francisco, Cal., has sent us a lithographed diagram of a target recently shot at in that city. The distance was 40 yards and the marksman was Dr. E. H. Pardee. The diameter of the bull's eye was 4 inches, and the string made from the center of the bull's eye to the center of the bullet hole was 131/8 inches. The Doctor's worst shot measures 21 3/16 inches from the center of the bull's eye. The engraving published herewith shows the target as it appeared at the end of the contest.



Facts are wanting in this statement to make it perfect. These are, whether the shots were fired off hand, what kind of a rifle was used, whether a target rifle with telescope sight, or an ordinary one; also, what the force of the wind was and its direction with relation to the target. Correspondents should endeavor to give all the facts when writing for publication.

An Immense Temple of the Muses.

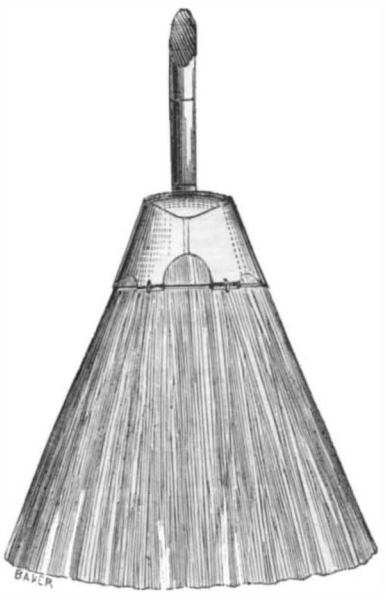
Louis Napoleon is building in Paris the largest structure of modern times designed as a place of amusement. It is an opera house which will rival in extent and grandeur the Coliseum at Rome. It will cost about $5,000,000, and will be constructed entirely of stone, brick, and metal. Nothing combustible will enter into its composition. It will cover seven and a half acres and be two hundred feet in external hight. The auditorium, however, is calculated to seat only about three thousand persons. Every box will have its separate saloon attached, fitted up like drawing rooms, and a carriage way will be constructed to the second story from the street. The most successful and celebrated artists of France—painters, sculptors and architects—will be employed in its ornamentation and erection. It will be entirely unapproachable in finish and richness by any structure at present existing.

Removing Hyposulphites.

The last traces of hyposulphites of soda can be eliminated from paper pictures by means of electrolysis. The method is due to Dr. W. Reissig, of Vienna, and consists in placing the proofs between two sheets of metal, binding them together, and passing the current from a Bunsen's battery through them. The delicacy of this way of detecting minute traces of hyposulphites is well known, and I hope its application to the decomposition of the deleterious salts will be found practicable. The manipulations required will not be at all difficult—far less so than rolling a number of proofs. Without previous trial, I should suppose a good way of proceeding would be to place a sheet of polished metal at the bottom of a shallow dish, and attach to it a wire proceeding from the positive pole of a battery. On the metal arrange a number of well-washed prints, and upon the prints place another sheet of metal connected with the negative pole, cover the plates with distilled water, and let the current pass. I do not think the plates need to be made of silver. Metal that coach-lamp reflectors are made of, composed of silver and copper rolled together in varying proportions, would probably be found to answer. The first cost of this process for destroying the hyposulphites would be the greatest, and that would not be much. The battery might cost 7 s. 6 d., and the metal 6 s. or 7 s. per pound.—*British Journal of Photography.*

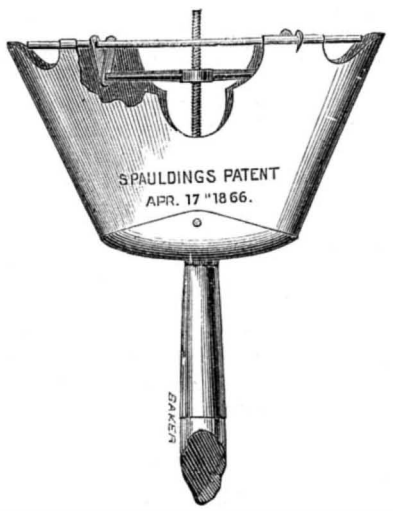
SPAULDING'S PATENT BROOM HEAD.

Many of our farmers raise broom corn, and they have been in the habit of utilizing such portions of the product as did not find a ready market, by forming it into brooms which serve a temporary use. In



this they have been assisted by our inventors, who have contrived receptacles for the broom, so that it was an easy matter to construct an efficient implement for the practice of the virtue "next to godliness," and still preserve the head for another reception of broom corn.

The engravings annexed show one of these improvements. The head is formed of metal, and is attached to a metallic shank for the reception of the handle. The shank carries a screw which passes through a cross bar, to the extremities of which are attached arms pivoted to stiff wires in the web of the metallic case, at the lower edge, forming a toggle joint. By turning the shank to the left these arms are released, and the shell is allowed to expand, when it can be filled by the broom. Then the shank



is turned to the right, screwing up the arms and contracting the sides, when the broom is clamped tightly between the sides of the shell. It seems to be a very efficient device for the object sought.

Patented April 17, 1866. Manufactured by Lakin & Hall, sole agents, Brodhead, Wis., to whom all orders should be addressed.

The Queen's Portrait for Mr. Peabody.

Photography is, we understand, chiefly employed as the aid in producing the portrait of Her Majesty to be presented to Mr. Peabody. It is entrusted to Messrs. Dickinson, of Old Bond street. Though only half-length, the painting is 14 inches long by nearly 10 inches wide. For the first time, for the presentation of her portrait to a private individual, Her Majesty sat in the only robes of state she has worn since the death of the Prince Consort—the costume in which she was attired at the opening of the present Parliament. This was a black silk dress, trimmed with ermine, and a long black velvet train similarly adorned. Over her Mary-Stuart cap is the demi-crown, while the Koh-i-noor and one rich jeweled cross, presented by Prince Albert, form her only ornaments. To complete this portrait, Her Majesty gave Mr. Tilt several long sittings, and has now expressed her unqualified approval of the water-color shown at Mr. Dickinson's. This, however, is but the commencement of the process. The portrait is to be done in enamel by Mr. Tilt, on a panel of pure gold. In these enamel paintings, to bring out all the brilliancy of their colors, they have to be burnt in a furnace at least five and generally six times. The heat to which they are subjected is so intense as to be only short of that which would fuse gold, and the most exquisite care is necessary neither to let the picture heat too soon, nor, above all, cool too rapidly, as in either case the enamel would crack. So large an enamel portait has never been attempted in this country. After being submitted to the Queen on its completion, it will be forwarded to Mr. Peabody, who intends to deposit it where it may be best seen in a large institution which he has founded in Boston, his native town.—*Photographic News.*

[The *News* is mistaken in the place of Mr. Peabody's nativity. He is a native of Danvers, Mass.—[EDS.

THE New Haven *Courier* says that during a recent thunder storm in that city, an old hoop skirt, lying in the middle of the street, caught the electricity, and in spite of rain falling at the time, burned and smoked away all there was combustible about it.

THE Paterson (N. J.) *Press* says that the falls are destined to be almost entirely done away with, under the constantly increasing demand for water power from the mills.

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A STRANGE INCONSISTENCY.

Toward the close of 1862, the Chief of the Bureau of Steam Engineering conducted a series of "dock races" with the machinery of the original monitor. His summation of the result is, that "the great cylinder condensation should be decisive against the use of this type of engine." This, he states, is due to the peculiar construction of the cylinders. His reasoning—the prelude to his condemnation of the engines—is so remarkable, and so totally at variance with well-established facts in relation to conduction and radiation of heat, that it has attracted much attention in our mechanical cotemporaries abroad. No less an authority than John Bourne has recently, in the *Engineer*, expressed his surprise at the absurdity of Mr. Isherwood's deductions. But the inconsistency of Mr. Isherwood with his own reasoning and deductions, seems to have escaped attention.

The following extract from Mr. Isherwood's work are so clear in illustration of this point that we give them below:

Extract from Mr. Isherwood's "Report on Erie Expansion Experiments" (see "Experimental Researches in Steam Engineering," Vol. 1, page 110.)

"The condensation in the cylinder due to the variable temperatures of its metal, caused by the alternate exposure of its interior surface to the different temperatures of the steam on the opposite sides of the piston, is too insignificant to be included in a practical estimate, even under the most favorable conditions. The surfaces in question are, of course, the sides, ends, and nozzles of the cylinder, the interior of the valves, and the disk of the piston. To understand how very small the condensation due to this cause must be, we will consider the conditions of the simplest case, namely, that which occurs when using the steam without expansion. For this purpose, let us suppose the piston to have just arrived at one end of its stroke, and the whole interior of the cylinder to be filled with steam of the boiler temperature, and its surfaces, to a certain depth, to have the same temperature. Now, let the exhaust valve be opened, and then this steam will be discharged into the condenser and replaced with vapor of the greatly less temperature of the back pressure. This vapor will, of course, absorb heat from the metal of the cylinder, but the maximum quantity can only be that which would raise the temperature of the cylinder full of back-pressure vapor to nearly that of the metal; and if we consider the extreme tenuity of this vapor, the trifling weight of a cylinder full, and the difficulty with which it absorbs heat, we shall appreciate how little will be taken up. In the practical operation of the steam engine, the cylinder full of back-pressure vapor is pushed out by each stroke of the piston into the condenser, and, of course, carries with it whatever heat it had obtained from the metal of the cylinder by contact and by radiation. That the quantity, however, is practically inappreciable, will appear from an examination of the experiment made with the steam cut off at eleven-twelfths of the stroke of the piston from the commencement, in which the whole difference between the weight of feed water pumped from the tank into the boilers, and the weight of steam accounted for by the indicator, is only 2·91 per cent of the former.

In this slight discrepancy is, of course, included the loss from every kind of leakage, and from the condensation by external refrigeration in the steam pipe, valve chests, and cylinder. Slight as the loss from this particular cause is seen to be when using the steam without expansion, it will be still less when the steam is used expansively, decreasing as the measure of expansion is increased; for as the temperature of the steam urging the piston will continue to fall from the point of cutting off, to the end of the stroke, whatever heat the steam of reducing temperature obtains from the metal of the cylinder, previously imparted by its higher temperature, before the point of cutting off, will be utilized in producing a dynamic effect upon the piston, and the temperature of the metal will, to that degree, be made lower for the back-pressure vapor to act on and which will, therefore, obtain less heat from it."

Extract from Mr. Isherwood's "Report on his Experiment with the Engines of the monitor. (See same Vol., page 339.)

"From the description of the monitors' engines, it will be perceived that the two cylinders occupy the same barrel, the separation being made by a simple partition of cast iron in the center. Further, that during a large portion of the time, the boiler steam occupies one end of one cylinder, while the adjacent end of the other cylinder is open to the condenser. There is, consequently, one end of one cylinder maintained at the temperature of the boiler steam, while the adjacent end of the other cylinder, separated only by a cast-iron partition is exposed to the temperature of the condenser. This arrangement, immaterial as it appears, and is, in a mechanical point of view, powerfully affects the economic result by its great influence on the cylinder condensation. To appreciate it, it is only necessary to imagine the piston of the starboard engine, for example, to be near the outboard end of its stroke, in which case nearly the whole of the cylinder of that engine will be filled with steam. At this moment the piston of the port engine is near the center of its stroke, and about one-half of the port cylinder adjacent to the starboard cylinder will be open to the condenser, and exposed to its refrigerating influence; consequently, the boiler steam in the starboard cylinder has been exposed for about one-half of the stroke of its piston to this refrigerating influence from the port cylinder, transmitted through the iron partition of the two cylinders, which, as their diameter is great in proportion to the stroke of their piston, forms a large proportion of the surface in contact with the steam. Nor does the evil end here, for as the sides of both cylinders are the same piece of iron, those of the one being merely an extension of those of the other, the conduction of heat is very rapid from one cylinder to the other, and the heat imparted by the steam to the sides of the starboard cylinder, quickly passes along by conduction to the sides of the port cylinder, whose interior is in communication with the condenser, and whose exterior is exposed to the atmosphere; the inevitable result, it is manifest, must be a largely-increased steam condensation in cylinders of this type of engine over that in the cylinders of engines of the usual type; how much larger; is a question which experiment alone can answer."

From the above extracts it has been seen that Mr. Isherwood has stultified himself, and that, too, in the same book. Was this because he had certain theoretical views to sustain, which are inconsistent with the results of his final experiment? It seems that the object in the latter experiment, was to condemn a certain style of screw engine.

A comparison of the extracts we have given, not only casts a strong suspicion on the honesty of Mr. Isherwood's reasoning, but of far greater importance, it suggests a grave doubt with respect to the truthfulness of the numerous experiments in the two official volumes alluded to. We make these remarks with great regret that they are called for by the premises. But when it is remembered that these coal-burning experiments have cost thousands upon thousands of dollars of the public money, it is very unfortunate that their accuracy should be questioned, or that any should say they were made to establish certain theories. The bare suggestion is enough to seriously impair—if not to destroy—any value which it is possible they might otherwise possess.

Still further, the Chief of the Steam Bureau, it seems, was so anxious to condemn the successful engines of the *Monitor*, that he did not even scrutinize them sufficiently to ascertain how they were made. He asserted, for example, that the two cylinders "have but one bottom in common." On the contrary, they have a separate bottom to each, with a space between them. As the two bottoms are in juxtaposition, of course, radiation is effectually prevented. A great deal more, and to the point, could be said on this subject, but we leave it as it stands, for the present. PER SE.

Silicated Whitewash.

M. Ch. Guerin called the attention of the French Academy to a new method of obtaining, by a cold process, a silicate completely insoluble, which can be applied either as an external coating, as in the case of glass or iron, or made to penetrate through the interior of the substance, as for the preservation of wood and other vegetable matters. The process is very simple: a thin coating of slaked lime made into a paste with water, or whitewash, is laid on the object to be silicatized, and when this has been allowed to dry, silicate of potash is applied over the coating; the effect, it is asserted, being that all the portions touched by the solution of potash become completely insoluble. and of very great adherence. In order to obtain an insoluble silicate in the interior of a substance, all that is necessary is to impregnate it by immersing it in whitewash, or lime water, and when it is dry to steep it in a solution of the silicate of potash.

By this means it is proposed to prevent the decomposition of vegetable substances by petrifying them; also to protect porous building stones and brick against air and damp; iron, by a coating of paper, pulp or other finely-divided woody matter mixed with slaked lime.

Again, letters, characters, or any other device can be traced with the silicate on any surface spread with lime, and those portions touched by the silicate will alone adhere and become insoluble. Or, if they be traced with a solution of gum arabic, and the whole be washed over with the silicate, the parts protected by the gum can be washed off, the rest remaining in relief, as the letters, etc., do in the first place.

The process seems to be substantially the same as the English process, known as Ransome's.

Useful Recipes.

PURE, inodorous glycerin will completely absorb the odors of flowers, if you submit them to a digestion for several weeks in a well-closed jar, and in a moderately warm place. The flowers should be covered by the glycerin.

CHLOROFORM removes stains from paints, varnishes, and oils. Another very effective fluid for the same purpose, is a mixture of six parts of strong alcohol, three parts of liquor ammonia, and a quarter part of benzole.

A GOOD white enamel for earthenware may be prepared as follows:—Melt and oxidize 60 lbs. of pure lead, and 40 lbs. of pure tin; 100 lbs. of this oxidized metallic compound should be melted with 50 lbs. of fine white sand (free from iron), 50 lbs. of common salt, 20 lbs. of powdered feldspar, 6 lbs. of nitrate of potash, and 6 lbs. of litharge. Grind the melted enamel finely in a mill and apply it to the ware.

FOR filling cracks in wooden furniture try the following cement:—Moisten a piece of recently burnt lime with enough water to make it fall into powder; mix one part of the slaked lime with two parts of rye flour, and a sufficient quantity of boiled linseed oil to form it into a thick plastic mass.

THE following receipe for a transparent pomade we copy from a foreign periodical:—Dissolve ten grains of Chinese gelatin by boiling in one ounce of distilled water, and remove the impurities swimming on the surface; mix this solution with four ounces of warm glycerin perfumed by five drops of oil of bergamot, or three drops of oil of roses, and colored by extract of rhatany. The mixture, when cold, should be tried by rubbing between the hands whether it will melt or not. If it should be too stiff, then warm it up in a water bath, and add to the fluid compound a small quantity of glycerin and let it cool; but if it proves to be too soft, add one to two grains of gelatin, previously dissolved in water. Heat the pomade to a temperature of 40 deg. Cent., and pour it into glass vials, where it will become stiff and transparent.

BEDBUG POISON.—In a pint of strong decoction of quassia, dissolve 60 grains of corrosive sublimate, and two drachms of muriate of ammonia. Label accordingly.—*The Druggists' Circular*.

LIQUID BLACKING.—Boil one ounce each of powdered galls, starch, and copperas, and two ounces of white Castile soap with two quarts of water, then strain and mix with three ounces of fine ivory black, and six ounces of molasses.

SOLVENT FOR OLD PUTTY AND PAINT.—Soft soap mixed with a solution of potash or caustic soda; or pearlash and slaked lime mixed with sufficient water to form a paste. Either may be laid on with a brush or rag, and when left for some hours will render its removal easy.

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Clay vs. Iron Gas Retorts.

MESSRS. EDITORS:—Can you inform me why iron retorts are still used in the gas works of this country? It is a well-established fact that fire-clay is not only more durable but, if made in a systematic manner, comes much cheaper than iron. I was connected with a clay-retort works in England and know that they have entirely superseded iron there.

CLAY RETORT.

Philadelphia, July 16, 1866.

[It is a matter of surprise to us that all large gas works have not adopted the use of clay instead of iron retorts, especially after informing themselves of what practice and experience has fully demonstrated both in this country and in Europe. In such gas works where the trial may not have resulted favorably, the result can only be attributed to defective setting or mismanagement, as they actually require less care in working them. It is only in very small works, which cannot, from their size, use an exhauster, that clay retorts are not so well adapted. Yet there are many such who do use them profitably.

At a meeting of the London Institution of Civil Engineers, a paper was read on the use of clay retorts in gas making from which we make the following extract —

"The iron retorts, lasting 365 days and working 1½ cwt. of coal for each charge, effected the carbonization of 2,190 cwt. of coal, which, at 9,000 cubic feet of gas to the tun, gave a total quantity of 985,500 cubic feet of gas per retort, while clay retorts lasted 912 days, carbonized 5,472 cwt. of coal, which, at 9,000 cubic feet of gas per tun, gave 2,462,400 cubic feet of gas per retort.

"The most practical working of clay retorts was with the addition of an exhauster. This reduced the pressure on the retorts, and prevented the escape of gas through pores and fissures, and by that system, the quantity made was increased about 200 feet per tun of coal."

In the discussion the general results given in the paper were confirmed. It was, however, stated that the quantity of gas obtained from iron and from clay retorts must be in proportion to the quality of the coal used. In some places where 7,600 cubic feet of gas had been produced by iron retorts, as much as 9,200 cubic feet had been made in clay retorts, and the production had been as high as 11,000 cubic feet.

There are now, we believe, in the vicinity of this city three clay-retort works whose products are nearly, if not quite, equal to those formerly obtained from Europe.—EDS.

Pressure in Boilers.

MESSRS. EDITORS:—Your correspondent who inquires why his boilers fail to stand the pressure required, was properly answered so far as his queries and statement went. There is one important point which he does not state. That is, the size of his grate surface and the area of the passage between the bridge wall and shell of the boiler. The area of the flues would warrant a grate surface of 36 feet. The area of the passage over the bridge wall should not have been less than 1,200 square inches. There is a vicious habit, attending boiler setting, in making this passage too small, thereby concentrating the intense heat of the furnace in front and over it, thereby heating the plate so hot as to make globules of the water in contact, hence destroying the plates. I think the whole trouble will be found, if we get the facts in the case, in a contracted passage at the point mentioned. F. W. B.

New York, July 9, 1866.

Home-Made Aluminum.

MESSRS. EDITORS:—Being in want of some aluminum, I overhauled (as usual in case of a want) some two or three back volumes of the SCIENTIFIC AMERICAN, but only found a brief note in a recent number; acting, however, on the suggestions, I procured a lump of alum, dissolved, added soda, and to the washed precipitate added muriatic acid; to this solution I afterward added aqua ammonia, expecting to see a metallic precipitate; but got only a pasty mess, which yielded alumina before the blow pipe, with no trace of anything like metal. Will you please put me right?

If there is any practicable method of obtaining the metal at a cheap rate, I think many of your readers would prize the information. AR. IND.

[The brief note to which Ar. Ind. refers, explained how to produce alumina, a very different thing from aluminum. The metal cannot be produced at a cheap rate.—EDS.

Questions for Millers.

MESSRS. EDITORS:—I have been reading your paper for some time, and find there is a great deal of information to be gained from it. I wish to gain a little upon a point I have not yet seen discussed in its columns. I am at present running a steam flouring mill at this place, and have some trouble in keeping the bush of one of my burrs in order; it is a cast bush, with wooden followers, burr running with belt; I wish to know where the pull on the bush is—whether directly in front of the power, or at some other point. I wish to know this in order to set my followers in their proper position.

I also wish to know why the composition boxing, as it is generally used about engines, has not been adapted for bushing—if it is good at one place why not at another? H. C. WILKINS.

Bloomingdale, Ind., July 6.

Personal.

We understand that Congress proposes to establish a Commissionership of Education, for statistical and other purposes. It is an excellent idea, if it falls into right hands. We have heard the name of Alfred B. Ely, of Massachusetts, suggested in connection with the place. No better appointment could be made for the good of the country, and we hope the suggestion may be carried out in good faith. We have known Mr. Ely for several years, and feel assured that he would bring to the office ripe experience, large attainments, and great force of character, and qualifications which would insure both popularity and success.

SPECIAL COMMISSIONER OF REVENUES.—Mr. David A. Wells, of the present revenue commission, has been appointed to the office of Special Commissioner of the Revenues, created by the new Internal Revenue act, from on and after the 1st of August next. The office is one of wide scope, and Mr. Wells is necessarily invested with great discretionary power in investigating frauds and bringing offenders to justice. For a year past Mr. Wells has devoted himself assiduously to the interest of the Revenue Department, and his appointment to the new office is a well-merited compliment and reward.

The European Squadron.

Our present force in European waters amounts to twelve vessels, carrying 141 guns. But it is thought that should the existing war between Austria, Prussia and Italy continue for any length of time, this force will require to be largely increased in order to afford adequate protection to American interests in that quarter. The splendid new steam frigate *Chattanooga* has been assigned to duty in the squadron of Admiral Goldsborough, and will sail for Europe as soon as her outfit is completed. The *Chattanooga* will prove a most valuable acquisition, being not only a very powerful vessel, carrying a heavy battery, but also a very swift one, having on her trial trip made an average of 15 knots an hour under unfavorable circumstances. Several other vessels are also spoken of as being designed for duty in Europe, among which we may mention the new sloops-of-war *Madawaska* and *Neshaminy*, both fitting for service at this port.—*Journal of Commerce.*

RATHER WARM.—Prof. Loomis of Yale College states that on the 17th inst. the thermometer stood at 102 in the shade at New Haven, and that the day was the hottest that has occurred for 89 years. We are thankful for this information, and trust that the same length of time may elapse before the return of another such spell. At Wheatsheaf, N. J., the thermometer actually reached 104 degrees for a short time in the shade.

THE HEATED TERM---HOW TO KEEP COOL.

It is probable, if not certain, that never in the history of this country, has a summer of such severity of heat as this been experienced. In our school-boy geography, we were told that the climate of the temperate zones consisted of "extremes of heat and cold." It is literally true. We have in winter polar cold, and in summer tropical heat. It is not an exaggeration to say that the temperature of the thermometer here during the first two weeks of July equals anything of the sort under the equator. Not only in large cities, as New York for instance, but in the country, that anticipated paradise to which the citizen flies on the approach of the warm season, the heat has been anything but temperate. Existence has resolved itself into the simple effort to follow the oft quoted advice, "keep cool," but how is it to be done? We have a few advisory suggestions to make, applicable, we are aware, not to all, but peradventure to some whose circumstances may make their adoption feasible.

1st—Diet. Eschew carbon-generating food, such as meats, rich cake, spiced dishes. Let alone crude substances which require a large draught on the force of the animal organism to prepare them for assimilation and absorption with the blood, as fresh fish, pastry, puddings, and rich soups. Eat lightly; only enough to keep the system in tone. Avoid repletion and over eating. Shun stimulants. Use ripe fruit freely, salt meats well cooked, fresh vegetables, bread, farina, moderately strong tea, no coffee, and but little ice-cold water.

2d—Condition of mind and body. Do not argue on politics, religion, or any pet hobby. Avoid scandal. Do not get angry, nor fearful, nor anxious. Don't fret. Don't arraign Providence, nor find fault with your neighbors. Cultivate patience, and a stoical calmness under provocation. Do not run, walk fast, nor get into a perspiration unnecessarily. Although perspiration may not, in itself, be injurious when provoked by a laudable endeavor, do not allow it to be suddenly checked by ceasing exertion and remaining passive in a cool place.

3d—Preventives. Wash the whole body every morning, and if convenient, at night, also. This can be easily done with a quart of water and a sponge or rag, or with the bare hands. Rub down dry with a towel. Apply a brush to the skin smartly, or a bit of hard woolen rag if you have not horse-hair mittens. Your body needs a surface glow as much in summer as in winter. Those who have a bathroom in their houses know the advantages of daily bathing, especially in summer. But a bowl of water is a good substitute. Change under-clothing every day if possible, if not as often as is practicable and convenient. Put in your ice-water a little spirit, or if you do not use ice, cool your water with a little tartaric acid. It is equal to lemon juice, and cheaper. A piece as big as a walnut put in a common bucket, or kept in the glass from which you drink, will give a delicious acidulated taste to the water, and increase its cooling properties.

To keep the house cool, hang up before your open doors or windows, or suspend in the draught across the rooms, blankets dipped in cold water and wrung out sufficiently to prevent dripping. This is an easy, simple and wonderfully effectual method of cooling rooms. Keep the door steps and pavement wet, and sprinkle water in your entry. Do not sleep on feathers nor hair mattresses. Straw, palm-leaf, or husks are preferable. Never sleep naked. Wear a woolen or gauze undershirt, and cover with a sheet. The sheet need not touch the body, but can be easily secured by the corners to the bed posts, leaving a space under its roof. It is a mistaken idea that entire nakedness is conducive to coolness. It is not so. Some material to absorb the perspiration should be worn next the skin.

These suggestions are drawn from an experience of years, and may be relied upon as worthy of at least one trial. The pivot upon which the whole turns is that of internal and external cleanliness, both of mind and body. A perturbed, anxious, excited mind, is as impure as a surfeited stomach or a neglected skin.

Photographic.

Card groups, now much in favor at Vienna, are as follows:—It is a card of the ordinary dimensions, containing a group of seven persons, distributed

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lengthwise on the card. It represents the interior of a drawing room, a paneled wall, chimney piece, etc., forming the background. Two of the figures are seated at a grand piano, playing a duett, while a third one turns over the music; a fourth, standing near, leaning on the chimney-piece, apparently listens to the music; a fifth sits with an embroidery frame on her lap, engaged at work; another sits before a writing desk, or Davenport, writing a letter; while another stands by with a letter in her hand, apparently in conversation with the last. The scene is simple and domestic; a family group at home. The grouping is admirably managed, the photography exquisitely perfect and delicate, at once excellent in definition, light and shade and pictorial effect.

Another new style is a full-length *carte-de-visite* portrait of a gentleman, front view, and on the back of the card is pasted the portrait of the same person, in the same position but taken from his back, and this being reflected in a little piece of looking-glass placed in front of the back picture, you see the whole of the gentleman at one glance, both front and back view.

NEW INVENTIONS.

The following are some of the most prominent of the patents issued this week, with the names of the patentees:—

STOVEPIPE DRUM.—C. C. WEBBER, Calmar, Iowa.—In this stove drum are a series of flues to thrice convey the product of combustion from end to end. In connection with the central flue is an adjustable pipe, worked by a rod passing out of the top of the drum; by adjusting this a direct passage of products can be formed with the stovepipes, or by lowering it the circuit can be established.

CLOTHES-WASHING MACHINE.—PHILIP VAN BUSSUM, Henderson, Ky.—This invention consists in a novel construction and arrangement of the concave and the manner of applying the pressure thereto, whereby it is believed that a very simple and efficient washing machine is obtained.

HOLLOW AUGER.—J. H. SMITH, Pineville, Pa.—This invention consists of a frame or stock provided with an adjustable center rod, two adjustable jaws, operated by a right and left screw, and cutter.

CULTIVATOR.—ISAAC AVERY, Ottawa, Ill.—This invention consists in an improved draught attachment, whereby the device may be operated or drawn along by a moderate application of power, the plows moved either vertically or laterally, and the whole device placed under the complete control of the operator.

STENCH TRAP.—FRANCIS H. WILLIAMS, Syracuse, N. Y.—This nvention consists in a sink, the interior of which is provided with an inclined apron extending over the edge of a tray in combination with a valve which closes the communication between the sewer and the tray in such a manner that water or other liquid poured down through the sink will fill the tray and then by forcing the valve open run down to the sewer, but as soon as the supply of water stops the valve closes down on its seat, and the water contained in the tray, together with the valves, prevent the escape of stench from the sewer through the sink.

This inventor has also secured another invention for a similar purpose, which consists in the arrangement of a siphon tube with a floating valve, in combination with the sink or waste pipes leading from the sink or sinks in a building and with a suitable pipe leading to the sewer in such a manner that by the liquid remaining in the lowest part of the siphon, and by the valve, the communication from the sewer back to the sink is firmly closed and the escape of stench from the sewer into the house or building is prevented, and at the same time the communication from the sink or waste pipes to the sewer is uninterrupted.

STOVEPIPE DAMPER.—B. F. COWAN, New York City.—This damper is a hollow spheroid and revolves within an enlargement of the same shape made in the pipe where it is used. The flattened sides of the damper and of the enlargement in which it revolves are parallel with each other, and are also open. The damper is suspended from points which are midway from its flattened sides, and its place of suspension in the pipe is likewise midway of the flattened sides of its enlargement, so that when their flattened sides coincide with each other, an opening is formed through the pipe and through the damper from side to side, and communication between the lower part of the pipe and the upper part is interrupted.

TRUNK.—LUTHER JACKSON, Newark, N. J.—This invention consists in the arrangement of spring stops on the ends of the inside cover or tray in such a manner that when the tray is opened it is retained by the spring stops, and not liable to close down spontaneously, to the great annoyance of the person packing or unpacking the body of the trunk.

MUSICAL ATTACHMENT TO CAGES.—G. GUNTHER, New York City.—This invention consists in the application of a music box to a cage, in combination with a suitable detaching lever and rod extending in the interior of the cage in such a manner that whenever the bird jumps or steps upon the rod or stop lever, the music box begins to play, when wound up, and an agreeable surprise to the persons in the room is effected.

MACHINE FOR FLUTING WASHBOARDS.—CALVIN J. WELD, West Wardsboro', Vt.—The object of this invention is to provide mechanical means for fluting washboards, and it consists in a novel construction of devices for feeding the boards to the cutters; in raising the carriage when it is moved back, so as to keep the boards from interfering with the knives; in the holders that keep the boards in proper position while their flutes are being cut, and in the construction of the knives or cutters that produce the flutes of the boards.

CASTER BOTTLES.—BURROUGHS BEACH, West Meriden, Conn.—This invention consists in arranging within the bottle and extending in the direction of its length, a center shaft or spindle, having a series of radiating arms, in such a manner that without opening the bottle, it can be rotated therein, and thus by means of its several arms thoroughly pulverize the salt or other article in it, so that it can be freely discharged through its perforated cap.

ARTIFICIAL HANDS.—J. F. MAGUIRE, East Boston, Mass.—This invention consists in a novel manner of hanging the fingers and thumb to the hand, whereby they can be made to firmly grasp and hold articles of various shapes and sizes, and the fingers can be operated independent of the thumb.

OIL WELL PUMP.—W. E. MORRISON AND W. L. BETTS, Funkville, Pa.—This invention consists in attaching to the piston rod of the pump, above its upper valve, a cup-shaped vessel, perforated upon its sides and bottom, with its open end up. This vessel surrounds the rod, and is of a size to closely fit within the pump or well tube; and in the operation of the pump, it acts as a receiver for rivets or other articles falling through the well tube above it, by the presence of which heretofore much damage has been caused to the pump valves, etc.

INVALID BED.—HENRY CARDES, Bellville, N. J.—The object of this invention is to furnish an improved bed for hospitals, for use when the invalid is too feeble to be moved, in order to preserve the bed from becoming wet or defiled. It consists of a series of pipes, plane and concave plates, and a valve, combined with each other and with a bed or mattress.

BURGLAR ALARM.—R. M. WEBB, New York City.—This invention consists in so arranging upon the inside of a door, and with regard to the key hole of the lock in it, a device connected at its inner end with any suitable alarm that when a key is inserted in the door from the outside, or any tool used in the key-hole for picking or forcing the lock, the alarm will be instantly set free and sounded.

CURING ROLLER FOR CLOTHES WRINGERS, ETC.—J. B. FORSYTH, Roxbury, Mass.—This invention consists in curing a roller made of india-rubber or other vulcanizable gum on a hollow metallic core in such a manner that the heat is equally diffused throughout the entire mass of vulcanizable gum and the articles produced are of superior tenacity and toughness.

LAMP CHIMNEY AND SHADE.—J. H. CONNELLY, Wheeling, West Va.—By using a cylindrical glass chimney with a metallic cap piece, the durability of the chimney is greatly increased and liability to fracture by heat avoided. The cap piece is so formed as to constitute a most convenient means of applying the improved lamp shade to either the improved or common chimney.

SUPPORTER FOR WINDOW SASHES.—BURROUGHS BEACH, West Meriden, Conn.—This invention consists in a novel manner of operating the arms of the sash supporter, of that class having two arms hung upon a common center, whereby, when so desired, they can be both so swung or turned, and in conjunction with each other, as to be entirely relieved from the sash.

CORSET SPRINGS.—SAMUEL H. BARNES, New York City.—This invention consists in forming the springs of corsets of two or more thin metallic plates, placed one upon another, and so fastened together that they can move upon each other in the direction of their length, as the springs are bent, whereby their flexibility and elasticity, as well as durability, are greatly increased.

HATS AND CAPS.—CHARLES L. RAHMER, Brooklyn, N. Y.—This invention consists in a novel mode of securing the sweat lining within a hat or cap, for the purpose of allowing its interior to be ventilated when worn, while at the same time, the edge of the lining so secured, and which comes in contact with the head will readily adjust itself thereto, without being in the least degree inflexible.

THE MARKETS.

The exports of specie from the port of New York since January 1st amount to $49,363,138. For the week ending July 18, $2,239,270. Gold has fluctuated considerably. On Monday, the 15th, it was at 148¼ per cent., but next day it was 150 and above. The rate of interest was lower than before. Call loans are readily adjusted at 5 per cent.

ASHES—Pots are quite dull, but with continued light receipts, prices are supported; the sales are a few small lots at $825@$8 37½. Pearls are unsettled, and offered at lower rates, but we hear of no business.

BRICKS—Common Hard have advanced to $10 50@$11 50. Croton and Philadelphia are unchanged at $14@$15 for the former, and $40 for the latter.

CEMENT—Is in steady demand at $1 75 cash.

COFFEE—Laguayra, 17c.; Java, 24½c. gold, 32c.@33c. currency.

COPPER—Detroit, 33c.; Portage Lake, 32½c.

COTTON—Fair demand. Ordinary, 25c.@26c.; middling, 32½c.@37c.

FLOUR—Common brands, $8 30@$10; Genessee extra, $10 30@$13 50; Canada, $8 70@$10 20.

MEAL—Rye, $6 75@$7 40; corn, $4 75@$5 10.

GRAIN—Corn, 82c.@83c. medium Western; 83½c.@84½c. extra; Oats, 50c.@51c.

HIDES—The market is dull, but prices are very firm. The sales are 1,900 Buenos Ayres, 21½ lb., at 18¾c.; 600 Montevideo, 24 lb., 18c. gold; 2,000 do., 21 lb., 26c. currency; 5,347 Rio Grande, 20½ lb., 16c. gold, 20 days; 200 Wet Salted do., 60 lb., and 2,500 Texas, 24 lb., on private terms.

IRON—The market for Pig is quite firm, but there is not much demand at present, and the business is small; we only notice 300 tons Glengarnock Scotch, part at $47, ex ship; small lots Glengarnock and Garsherrie, $48@$50; and 100 tons No. 1 American, part for August delivery, $48 cash. There is no change in prices of Bar from store, and the demand is light.

LATHS—Are firm, with sales of 1,000,000 Eastern, at $3 25, three months.

LEAD—The market for Pig has become quiet, and, while the advanced prices are supported, yet it is scarcely as strong as last week; we notice sales of 300 tons Spanish and English at $7 25@$7 50 gold; some choice brands of English are held at $7 75. Bar, $11 75, and Sheet and Pipe $11 44 ₱ 100 lb.

LEATHER—The market for Hemlock Sole continues moderately active, and prices remain very firm. We quote Rio Grande and Buenos Ayres Light Weights, 32c.@33c.; Middle do., 34c.@35½c.; Heavy do., 36c@37c.; California Light, 31c.@32c.; Middle do., 33½c.@34½c.; Heavy do., 34c.@35c.; Orinoco, &c., Light, 30c.@31½c.; Middle do., 32c.@33c.; Heavy do., 29c.@32c.; Slaughter Upper in Rough, 31c.@33. Oak Sole is active at previous prices. French and American Calf Skins are in fair demand and firm.

LIME—Rockland is in fair demand, with sales of 3,000 bbls. at $1 50 for Common, and $2 10 for Lump, cash.

LUMBER—There is a good demand for Eastern Spruce, with sales of 465,000 feet at $23@$26, usual terms.

MOLASSES—Cuba (clayed and Muscovado mixed), 50c.; Muscovado, 52c.@58c.; Demerara, 65c.@75c.; Porto Rico, 68c.@80c.

NAILS—Cut, 6¾c.@7c.; Clinch, 8½c.; Forged Horse, 32c.@34c.; Pressed do., 22c.@24c.; Copper, 50c.; Yellow Metal, 33c.; Zinc, 20c.; and Ship and Boat Spikes, 7½c.@8c for 5 and 6 inch, and 7c.@7½c. for 6½ and 8½ inch, net cash.

SUGAR—Hard white, 16¾c.; soft white, 15¼c.@15¾c.; yellow, 13½c.@14¾c. cash. Raw sugars—Cuba, 9¾c.@12½c.; Clarified Porto Rico, 11⅝c.@14¼c.

WIRE—Telegraph, 9c.@10c. for Nos. 7 and 11, and for hoop skirt, 55c. for No. 18 covered, and 35c. for uncovered.

WOOL—State and Western fleeces, 50c.@60c.; pulled, 57½c.

ZINC—9½c. less 4 per cent. for gold.

Notes and Queries

J. U. R., of Pa.—The largest monitor is the *Dictator*.

J. W. C., of Ill.—Persons who preserve fruit and vegetables, acknowledge that green peas are very difficult to keep. We have seen specimens of what were called "fine," but they did not strike us as a success. Perhaps some of our readers will tell us the best way.

W. J. W., of Ill.—We published a recipe scarcely a month ago to prevent dampness on brick walls.

J. J. W., of N. B.—Siphons of so great a length as yours are apt to cause trouble by air collecting in the highest part. It is a question whether it will supply the boilers seven in number and 36 feet long. The way to find out is to measure the boiler evaporation for a given time. We cannot tell without more facts.

M. P., of Mass.—Many engines are now run by water instead of steam.

G. S. B., of Mo.—You have made a confusion in terms. The common eolian harp is acted upon by the air, but an eolian attachment to a piano is another thing, and is made to imitate the peculiar tone of the wind instrument.

F. E. H., of ——.—If you will look in the back numbers of the SCIENTIFIC AMERICAN, you will find a good deal upon the time to cut timber. That cut in the months of August, September, and October, is found to be the hardest, heaviest, and most durable, by actual experiment.

C. J. H., of N. Y.—We have examined your valve and its arrangement. Will not the steam leak through about the diaphragm as much as it would by unequal expansion of the valves? This trouble is very much overrated.

N. C., of Wis.—Any respectable hardware firm will sell you genuine emery.

A. D., of Ind.—We have used plain collodion to give an insulating coating to copper wire, with good results. Gun cotton and the dried collodion film are among the best known electrics. There is no such coated wire on sale.

R. J., of N. J.—An ordinary jackknife seems generally to be the most handy instrument for removing the tin-foil caps from bottles. This so-called tin foil is lead foil with a very thin skin of tin, and costs only about 30 or 40 cents per lb.

IMPORTANT DECISION IN INTERFERENCE CASE.

BEFORE THE EXAMINERS-IN-CHIEF ON APPEAL.

S. H. Hodges for the Board.

Interference between the application of Wait and Phelps, and that of A. Witherell.

No testimony was filed in this case by either party. On reference to the oaths of invention filed with the application, that of Witherell was found to bear date one day previous to that of Wait and Phelps; and, in accordance with the practice of the Office, the question of priority of invention was therefore decided by the Examiner in his favor.

On inspecting the files anew, however, it appears that the authority of the Justices of the Peace, who administered the oaths, is not certified by the County Clerk of their County, in either case, nor by any other officer who is shown to have the custody of their commissions. This was once required by the regulations of the Patent Office, but is no longer insisted on in practice. It is perfectly competent, no doubt, for the Office to dispense with it in *ex parte* hearings, and receive as evidence of the oath, the naked jurat of the magistrate, without inquiring into his authority. If they are satisfied, no one else can well complain, in such cases. But, when the question is between adverse parties, it is to be tried upon the usual rules of evidence, modified by such positive regulations as the Commissioner may prescribe. Among these rules of evidence, it is well settled, that the certificate of a Justice of the Peace, to an oath, is not admissible in trials at law, unless his official character is established under the seal and signature of the officer who has the legal custody of his commission, or is otherwise legally cognizant of his character.

In the course of the proceedings against Aaron Burr, an affidavit of his character, sworn to before such a magistrate, in New Orleans, was excluded upon two grounds, one of which was, that the certificate of the Governor, which stated that a man of the name bore that character, did not also state that he was the person signing the jurat. In Dunlap *vs.* Waldo, 6 N. H. R., 450, a deposition was offered, which had been taken before a Justice of the Peace in New York, and his authority was certified by the Clerk of the County in which it was taken. It was objected to as not sufficiently authenticated, and the necessity of some such voucher was distinctly recognized by the Court in a very full and elaborate discussion. But it appeared further, that in New York the County Clerk has the custody of the proper evidence of the magistrate's official character, and of his having taken the oath; and upon that ground only was the deposition admitted. There can be no question as to the insufficiency of the oaths in the case before us, as evidence between litigating parties. They must therefore be laid aside, and resort must be had to other testimony. No other means of ascertaining the dates of the invention by the respective parties remains except the filing of their applications. That of Witherell's was received in the Office on the 25th of February, 1862; that of Wait and Phelps on the 14th of the same month. The latter must, accordingly be adjudged the first inventors.

As there are reasons for supposing that this determination may operate upon Witherell as a surprise, he ought to be allowed an opportunity to introduce testimony upon the question, and to have a new hearing for that purpose.

The decision of the Examiner is reversed, and Wait and Phelps are declared to be the first inventors of the device in controversy.

Washington, D. C., Nov. 25, 1862.

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Improved Car Coupling.

There have been many accidents, some of them fatal, in coupling cars in the ordinary manner, and a number of attempts have been made to devise some efficient self-acting coupling, which would obviate the necessity of getting between the cars in the operation, but as none of them have been extensively adopted by railroad companies, it may be inferred that the difficulties in their use outweighed their apparent advantages. The engravings herewith presented illustrate an improved coupling, which, the inventor says, "works beyond my best expectations, being simple and not liable to get out of order. It is said by practical railroad men, who have seen it, to be the best self-acting coupling they have seen, as the common pin and link can be used with it."

Fig. 1

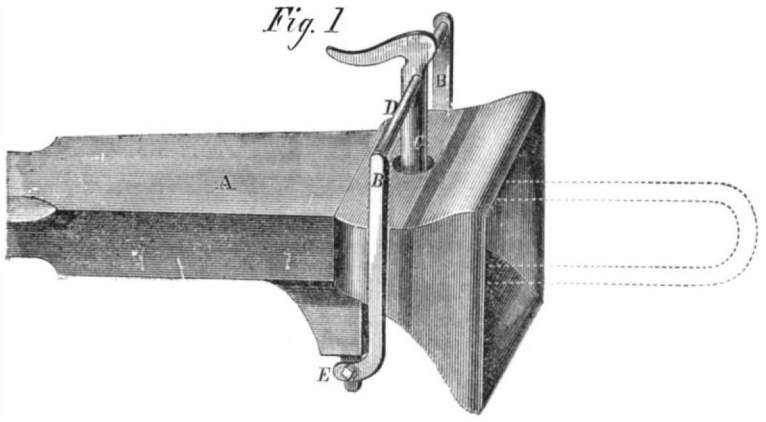
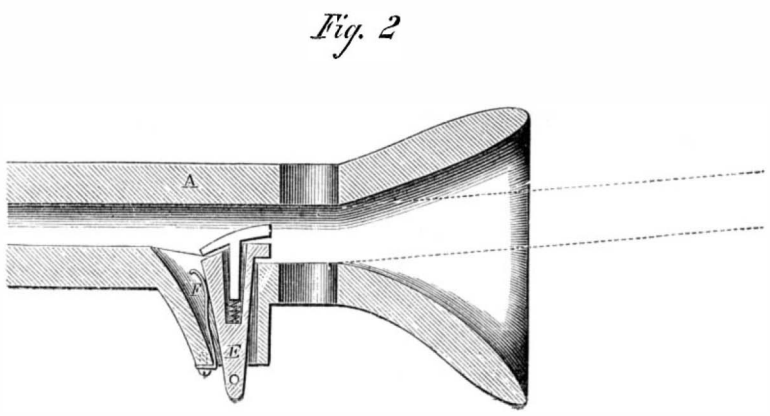


Fig. 2



PARSONS'S CAR COUPLING.

Fig. 1 is a perspective view of the coupling complete, and Fig. 2 is a sectional view of the same, showing the catch pin. A is the draw bar or shell, of cast iron as usual. The bars, B, Fig. 1, are of round or half-round iron, and slide up and down in slots cut in the sides of the shell. They are connected at the top to the pin, C, by the bar, D, and are curved under at the bottom and meet at the catch pin, E. It will be seen that when the pin, C, is raised, the catch pin, E, is also raised, and the head catches on the edge of the V-shaped space, and is held in position by the spring, F, thus sustaining the pin in its elevated position.

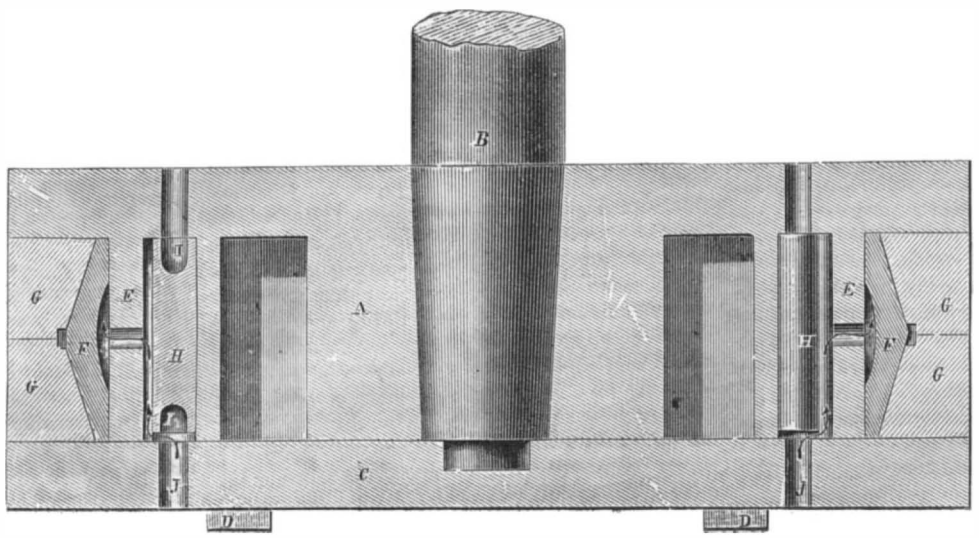
The operation is simple. The link passes in, and striking against the catch pin, drives it back, thus letting the link pin drop, while the catch pin, at the same time, falls out of the way. The subsidiary pin, G, drops into a hole in the catch pin, at the bottom of which hole is a coiled spring. This is intended to present a higher surface to the action of the link, so that when it is presented at an upward angle it cannot pass over the head of the catch pin without striking. The subsidiary pin is kept from lifting out by means of a key.

A shoulder is cast upon the inside of the shell back of the link-pin, which prevents the link from passing into the back of the space in which the catch pin plays. This secures the catch pin from injury. The back of the head of this pin is beveled so that the link, in uncoupling, cannot catch it, but will slide over the top. The seat of the link is on an incline and the mouth of the shell unusually flaring, especially on the lower lip, to insure the entrance of the link at all angles.

This improvement was patented Feb. 13, 1866, by J. H. Parsons, Quincy, Mich., whom address for further information.

Improved Piston Packing.

There is always more or less annoyance in the use of springs for expanding the rings of cylinder packings. The springs must be set when the cylinder is cold, and while working their tension is affected by the difference in temperature between the ordinary atmosphere and steam. The rattle of loose piston rings while the engine is working, and the loss of steam, and consequently of power, by ill-fitting packing is vexatious. Devices have been contrived to admit steam to the interior of the piston to act as an expander of the rings, but they are usually complicated and liable to derangement. The object of the improvement illustrated by the engraving is to make the use of steam for this purpose economical and effectual.



JACOBS'S PISTON PACKING.

A represents the "spider" or piston, in which the rod, B, is secured in the usual manner. C is the follower, fastened in the ordinary way, by bolts, the heads of which are shown at D. A circle or annular ledge, shown at E, supports the inner ring, F. This ring is in two semicircles, one end of each furnished with inward-projecting lips which project toward the center in radial spaces which divide the rim, E, into two parts. These lips are to retain the inner ring in place. This ring is beveled or inclined on its outer surface from the center to the edges, and on its outside circumference are fitted the outer rings, G, which are sawed obliquely across in segments in the usual manner. Their edges are ground to the inner surfaces of the head and follower steam tight. It will be seen that any pressure from the inner ring outwardly would have a tendency not only to force the outer rings against the inside of the cylinder, but also to press them firmly against the head and follower. This outward pressure is effected by steam. In lugs cast in the spider, just inside the circular ledge on which the inner ring fits, are holes reaching from the inside of the follower to the inside of the head, in which are loosely-fitting cylinder plugs, H, with a drilled recess at each end, as at I. A semicircular or concave recess, forming a part of this hole, connects by small apertures in the head and follower with one through the annular ledge, E. Now, if steam is admitted at J, it finds its way to the outside of the ledge, E, and fills the annular recess, F, on the inner surface of the ring. The ends of the plugs or cylinders, H, act as check valves, alternately on the inner face of the head and the follower, according to the motion of the piston. The arrows show the direction the steam takes in the forward stroke. It will be seen that the steam cannot fill the inside of the head, neither can it find a passage through. It must expend its expansive force directly on the rings themselves. Patent pending through the Scientific American Patent Agency. For further information address Bernard Jacobs, Selma, Ala.

Are You Insured?

The total amount of property destroyed by fire in this country, during the past six months, is estimated at $44,000,000. The insurance companies have suffered heavy losses, but with few exceptions they have faithfully responded to every call. We advise all property owners to get their buildings insured. They have no other reliance against losses by fire.

Red of Sorghum.

It is a fact long known, that sorghum contains a red coloring-matter. The following is the process used by Mr. Winter to extract it:—

The canes of the sorghum are stripped of their leaves and reduced to a pulp in a rolling mill, and well pressed, to extract the juice from them. The juice is used to make sugar or alcohol. The ligneous tissue soon begins to ferment rapidly. Care must be observed to prevent too rapid fermentation, because by an elevation of temperature, the mass will become putrid. When the operation has well proceeded, and the mass, after fifteen days, has acquired a red or brown color, stop the fermentation by drying, and grind the matter to divide it.

To isolate the coloring matter, infuse the powder for twelve hours in cold water, which dissolves a little coloring property. Press the mass strongly and put it to macerate with a very weak caustic lye, filter, press, and saturate the liquors with sulphuric acid. The coloring matter is separated in red flakes, which are collected on a filter, washed, and dried. This color is nearly pure, very soluble in alcohol, alkalies, weak acids, etc.

To dye silk and wool with it, use the ordinary tin mordant. Mr. Winter has noticed that the dyes made with this red resist the action of the light, and a moderate bath of hot soap. The extraction and uses of this coloring matter are known and practiced in China, where sorghum is cultivated on a large scale.—*Bulletin de la Soc. d'encour.*

In 1740 only 17,360 tuns of iron were made in England, and no less than 2,275 tuns were imported during the same year, from America.

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IMPORTANCE OF RAGS.

The wealth that is brought into existence by manufactures, or reproduced from apparently valueless substances by the marvelous, transforming power of human ingenuity, impelled by human wants, is a subject of surprise, even to the thoughtful observer. Enormous quantities of refuse matter are transformed into healthful fruits, grains, vegetables, and flowers, by the liberation of their gases and the dissolution of their salts. Bones, discarded by the housewife as useless, are wrought into forms of use and beauty, but in no instance is the value of articles which have outlived one condition of usefulness, and been submitted to the re-creative power of manufacture, more apparent than in the change which rags undergo.

From time immemorial rags have been the symbol of poverty, worthlessness, and vileness, and, as such, are referred to in the Bible and in the earliest profane works. Their usefulness as a material for paper seems, however, to have been discovered several centuries ago. The oldest specimen of paper made from linen rags contains a treaty of peace between the kings of Aragon and Spain, bearing the date of 1178. Raw cotton was, however, used for paper making before this time. It is tolerably certain that mills for making paper from rags were operated in Spain as early as 1085 (*vide* "Chronology of Paper and Paper Making," by J. Munsell.)

Rags, particularly cotton and linen rags, have been for many years one of the housewife's perquisites, and many a shining treasure in the kitchen and many an elegant teapot on the table, has borne witness to the thrift of the good woman in her practice of economical saving. All these rag-savings find their way to the paper mill. Their price has more than quadrupled since the diminution in the supply of cotton caused by the war. But the supply of this country is wholly inadequate to the demands of the manufacturers and the public. Once writing paper was not very generally used—at least, the people generally required but a small portion compared to the quantity they now demand. It might have been supposed that the increasing facilities of travel would have diminished the necessities for writing; but the contrary seems to be the case. Personal contact and mutual acquaintance beget new commercial alliances, and correspondence is necessary. The rags made in this country constitute but a small portion of those used by American manufacturers. We imported for the quarter of the present year ending June 30th, rags to the value of $426,766. In the ten years ending with 1865, the amount of rags imported was 209,883,718 pounds. Italy furnishes a large proportion of the rags brought into the United States. Everybody has heard of the Italian lazzaroni, who wear the scantiest dress of the filthiest rags; yet from this unpromising source nearly three-fourths of our supply comes.

Italy is the country of the open palm, and begging and rags go together. Begging there, and in other parts of southern Europe, is as much a profession as any industrial pursuit in this country, and the uniform of rags is more important to its successful prosecution than is the Government livery to the soldier. Still, valuable as rags are to the professional beggar, and important as they may be to abject poverty, they are far more important to the world at large; for up to the present time no other material has been found to usurp their place as the basis for paper. Their scarcity and constantly enhancing value have stimulated ingenuity to provide a substitute, but it has not been so successful as could have been wished. Straw, wood, and other substances have been, and are now, extensively used in the manufacture of the coarser papers, but nothing equals linen and cotton for the production of the firmer and finer qualities. Some of the European Governments, for this reason, have prohibited their exportation.

It is a little singular that advances in knowledge and refinement—the triumphs of intellect and the spread of intelligence—are so closely dependent upon the contributions of ignorance and poverty. Possibly the sheet upon which we are now writing, and the page that will bear to our thousands of readers these printed lines, were once the filthy rags that but half concealed the nakedness of a Neapolitan beggar or an Egyptian fellah. It is to be hoped that the transformation they have undergone is typical of the improvement which education and the arts are yet to work upon the meanest of the race.

THE PRODUCTION OF TIMBER.

Bayard Taylor, in a recent letter from Kansas, says that hundreds of acres of prairie, which have been protected from fires by contiguous cultivated fields, are overgrown with hickory and oak trees from four to six feet high. Where land is tolerably well watered and undisturbed, especially if in vicinity of wooded country, it will give support to what is commonly called a spontaneous growth of timber. The character of the growth depends mainly upon the quality of the soil. The seed may have remained for years in the soil, possessing a latent vitality, which awaits only favorable conditions for its development. Poor soils seem first to favor the pine, and this in turn gives place to the more rapid-growing deciduous trees, until the chestnut and the oak find fitting support and conditions for their growth and development. But in a country like this, where the demand for timber for manufacturing and building purposes threatens to rob us of our forests, it may not be well to rely wholly upon the unaided forces of nature for a supply. The resolution introduced into Congress to offer incentives to the planting of our immense prairies with trees, we regard as a timely suggestion. The great drawback to the settlement of those vast fertile plains is the absence of wood and an unfailing supply of water. These secured, and our prairies will be selected in preference to localities less favorable to agricultural pursuits, but which furnish wood and water in profusion.

Wherever there are forests there will be water, and the last is an indispensable requisite to human habitation. A section of country unprovided with elevated points as gatherers of the moisture of the clouds, must have a clothing of forest to retain the rains, which, on a naked plain, alternate periods of extreme drought with seasons of superabundant moisture.

THE NEEDLE GUN.

So much has been said about the Prussian needle gun of late, in the foreign journals, and the success of the Prussians with it, that many suppose it to be a new invention. On the contrary, it is twenty years old. We do not desire to depreciate it on this ground, but judging it solely by its intrinsic merit, it is not up to the standard of American breech loaders. All military men know that an essential point in a firearm is simplicity and certainty in fire. Neither of these qualities is found in the needle gun, for the mechanism is clumsy compared with recent inventions, and the ammunition is complicated, and costly to prepare. The principal idea in this weapon is in firing the charge from the front instead of behind, as in other weapons. To do this the percussion powder is put into a cavity in the base of a paper sabot, between the ball and the powder, the charge being exploded by a wire or needle thrust through the cartridge.

The experience gained in the war of the rebellion shows us that the "magazine arm," or that weapon where the charges are contained in the breech, is most deadly, when in the hands of skillful troops. Other breech loaders have their good qualities, but all who remember the part the Spencer rifle bore in the contest will concede the point we make.

Breech loaders have this disadvantage: troops must be trained long and thoroughly, or in the heat of battle the charges will be thrown away from heedless firing. The Prussian army have had experience with breech-loading guns for fifteen years, and in their recent battles did well, We published an engraving of this gun on page 124, Vol. 5, Old Series, SCIENTIFIC AMERICAN, to which we refer our readers. This was in 1850, nearly 17 years ago.

OUR COMMERCIAL MARINE.

The depredations inflicted on our commerce during the war were so serious as to create a fear that many years of peace would be required for its recovery. Indeed, when the devastations of war in our own borders were taken into account, the prospect was very disheartening. In 1856 seventy per cent of our foreign commerce was carried in American bottoms, while, in 1865, only about twenty per cent was under our flag. To be sure this enormous falling off was not occasioned by the destruction of American vessels, but was caused by the sale and transfer of our ships to foreign merchants, in order to obtain the protection of European flags which our own could not accord.

It is evident, however, that already we are rapidly assuming the position we occupied as a commercial nation before the war. Several causes combine to assist this recuperation. The abundance of material for ship building, our extended coast line, the fisheries with their thousands of hardy mariners, and the immense traffic of our seaports, sending away the surplus products of our vast interior, with which they are connected by navigable rivers and iron roads, and bringing in the manufactures of Europe, all direct a large portion of our enterprising energy into the channels of commerce.

The breaking out of a war in central and southern Europe, which threatens to involve every continental nation, and possibly England, will create additional demands upon our commerce. We must assist in feeding their immense armies and in supplying the places of the hundreds of thousands who are drawn from the pursuits of peace. Our shipyards, our wharves, our seaports, and the country at large, will feel the stimulus this state of affairs engenders. Too far removed from the scene of strife to be involved in its complications, our commercial connection with the nations of Europe will affect our industrial interests, in one respect at least, favorably.

Water Supply for Philadelphia.

The water works of Philadelphia have been for years a great curiosity to strangers. Fairmount has been one of the "lions" of Philadelphia. The reservoir, with its accompanying machinery for elevating and distributing the water of the Schuylkill, has been considered a monument of engineering skill and successful endeavor. It is found out, however, that the growing requirements of the city demand a new or at least an additional supply of water. Mr. Birkenbine, the Chief Engineer, proposes to obtain a supply of water from Perkiomen Creek, and form a lake or reservoir of supply, in Montgomery county, nearly 27 miles from the city, and to conduct the water through an aqueduct to some high point within or near the limits of the city, on which a distributing reservoir shall be constructed. This, it is thought, will give a head of 75 feet above

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that of Fairmount, and the estimated expense is about $10,000,000.

ISSUED FROM THE U. S. PATENT OFFICE

FOR THE WEEK ENDING JULY 17, 1866.

Reported Officially for the Scientific American.

☞ Pamphlets containing the Patent Laws and full particulars of the mode of applying for Letters Patent, specifying size of model required, and much other information useful to inventors, may be had gratis by addressing MUNN & Co., Publishers of the SCIENTIFIC AMERICAN, New York.

56,343.—EVAPORATING AND DISTILLING LIQUIDS.—James Adair and H. W. C. Tweddle, Pittsburg, Pa.

We claim the mode of distilling or evaporating petroleum or other liquids by passing through or over the liquid to be distilled or evaporated, heated carbonic oxide or carbonic acid, substantially as and for the purposes described.

Second, The combination of the air-tight furnace through the fire in which air and steam or either of them are forced, with the still or boiler for holding the liquid to be distilled or evaporated, and the pipes connecting the furnace and still or boiler, constructed and operating substantially as and for the purposes hereinbefore described.

Third, The air-tight furnace, A, constructed substantially as described for the production of carbonic oxide or carbonic acid, to be used in the manner of artificial combinations or mixtures of carbon with other fluid or solid bodies.

56,344.—CULTIVATOR.—Isaac Avery of Ottawa, Ill.

I claim, First, The attaching of the plow beams, A*, to pendants, a*, of the cross bar, C, by means of universal joints, D D', substantially as and for the purpose specified.

Second, The combination of the plow beams, A*, universal joints, D D', doubletree or evener, C, trace chains, E, and pulleys, e*, all arranged to operate in the manner substantially as and for the purpose herein set forth.

56,345.—EXTENSION IN CORSET SPRING.—S. H. Barnes, New York City.

I claim a corset spring, consisting of the parts, B, provided with pins, b, and slotted springs, B2, riveted as shown and having suitable clasps, C, and headed rivets, D, and of form corresponding to the body of the wearer, all constructed and operating in the manner and for the purpose herein represented and described.

56,346.—ANVIL AND VISE COMBINED.—J. D. Barton, F. S. Rogers and D. Fisher, Kalamazoo, Mich.

We claim the upright shaft, B, and levers, C and E, in combination with the several anvil appliances constructed and arranged substantially as described.

56,347.—SASH FASTENING.—Burroughs Beach, West Meriden, Conn.

I claim a sash supporter, consisting of the arms, A, in combination with the lever plate, K, and springs, E, when arranged together so that the said plate will act upon the said arms, substantially as described and for the purpose specified.

56,348.—GRAIN DRIER.—H. H. Beach, Rome, N. Y.

I claim, First, The within described grain drier, composed of the inclined perforated plates, B B' etc., and flues, G and H, the whole being arranged substantially as and for the purpose herein set forth.

Second, In combination with the above, I claim the vanes, x x', etc., arranged substantially as specified.

56,349.—BOTTLE STOPPER.—Josiah Beard and Moses Fairbanks, Boston, Mass.

We claim a protecting cap in combination with the stopper and fastening wire, passing through both the said cap and stopper as described.

56,350.—PLOW.—Charles Beidler, Allentown P. O., Pa.

I claim the segmental guide bracket, h, in combination with the screw rod, g, set nuts, j, handles, C C, and beam, A, and operating in the manner and for the purpose substantially as herein shown and described.

56,351.—MARINE CAR.—A. Blomquist, New York City, and C. Crook, Yonkers, N. Y.

We claim the arrangement of the drums, B B C, and paddle, D, in combination with the platform, A, constructed and operating in the manner and for the purpose herein specified.

56,352.—WATER DRAWER.—S. R. Boardman, New York City.

I claim, First, A well bucket, having three or more valves in the bottom thereof, and arranged at equal distances from each other, each valve being provided with a stem so arranged and operated that the ascent of the bucket will open those and those only that are upon that side of the bucket presented to the curb spout, as and for the purpose specified.

Second, In combination with a series of valves arranged around the bottom of the bucket as described, I claim a corresponding number of spouts attached to the bottom of the bucket, as and for the purpose set forth.

56,353.—PLASTER.—M. C. Bogiea, and H. B. Taylor, Philadelphia, Pa.

We claim a plaster consisting of mustard or other material or composition, permanently confined between layers of textile or other fabric, substantially as and for the purpose described.

56,354.—MECHANICAL MOVEMENT.—William Brant, Paris, Ill.

I claim the mode of imparting a reciprocating and alternate rotary movement to the shaft, G, by means of pulley, D, and thong, E, or devices substantially equivalent, all arranged to operate in the manner and for the purpose set forth.

56,355.—WELL PIPE OR TUBES.—S. Brewer and W. W. Winter, Cortlandville, N. Y.

We claim the device consisting of the springs, B B B, the shield, A, and the rod, D, all in combination, as and for the purposes herein shown and described.

56,356.—APPARATUS FOR PREPARING STARCH, SIZE, ETC.—John Briggs, Roxbury, Mass.

I claim in combination with stirrers, the tank, d, and foraminous cylinder, e, all operating together for the purpose set forth.

Also the steam jacketed pipe, s, when provided with the screw, o and arranged to operate substantially as described.

56,357.—BEER FAUCET.—Charles Brown and C. McGhie, Chicago, Ill.

We claim the plunger, B, provided with the hollow stem, C, having the holes, c' c' and c, therein as shown, in combination with the stem, D, having the spiral grooves, d, cut therein, when said parts are arranged to operate in connection with the body of the faucet, as and for the purpose set forth.

56,358.—TOY SLED.—John H. Brown, New York City.

I claim the combination of the button, G, rods, e f, and rudder, E, arranged with the horse, D, and sled, A, and operating in the manner and for the purpose herein specified.

56,359.—HORSE HAY FORK.—J. S. Brown, Washington, D. C.

I claim the employment of movable bars, D D, to cover and uncover fixed barbs or shoulders, C C, substantially as and for the purposes herein specified.

I also claim a divided shaft, A, to be opened in dovetail or inverted wedge form, and closed in connection with the uncovering and covering of the barbs, by movable bars, D D, substantially as and for the purposes herein set forth.

56,360.—CLOTHES DRIER.—O. C. Brown, Iberia, Ohio.

First, I claim broadly a clothes drying rack consisting of a series of suspending rods, bars or equivalents, attached to flexible supports to adapt the rack, as a whole, to be wound upon an axis or windlass, in any manner substantially as described.

Second, I claim a flexible clothes rack consisting of the straps, C C', blocks, D D', and supporting bars, F, all combined and operating substantially as described.

Third, In combination with the above I claim the frames, A A', and windlass, a2, arranged and operating substantially as described.

56,361.—LAMP BRACKET.—T. W. Brown, New York City.

I claim the improved socket plate made with the recess and its openings and the semicircular bearing arranged with the projection of such plate, substantially as specified.

I also claim the application of the reflector supporter, d, to the socket plate, B, instead of applying it to the ring arm in the usual manner, the same presenting advantages in the casting of the ring and its arm.

56,362.—HORSE POWER.—H. L. & J. A. Buckwalter, Kimberton, Pa.

First, We claim, in the construction of horse power, the combination in one wheel of the sprockets which engage the shafts of the chain and the cogs which communicate motion to the counter shaft, substantially as described.

Second, We also claim in horse power placing two counter shafts in gear with the cog wheels of the machine, one within and one without their rims, in combination with the belt wheel, the same being so made and arranged that the belt wheel may be changed from the one to the other at the pleasure of the operator, substantially as described.

56,363.—ROOFING CEMENT.—M. Buell, Truxton, N. Y.

I claim, as a new article of manufacture and sale, the paint or composition which I have herein described.

56,364.—COFFIN.—John Burns (assignor to himself and Joseph W. Baker), Providence, R. I.

I claim, combining with a wooden coffin of the usual construction, a lid of marble or other equivalent material, substantially as described for the purpose specified.

56,365.—CRIMPING MACHINE.—G. Cabell, Quincy, Ill.

First, I claim the combination and arrangement of an iron, F, in one or each of the hollow fluted cylinders, A, substantially in the manner and for the purpose as herein set forth.

Second, The sliding pivoted cap plates, G, as arranged in combination with the fluted cylinders and irons, substantially in the manner and for the purpose as herein set forth.

Third, The slotted curved spring, B, screw rod, C, projecting arm, D, and grooved collar as arranged in their connection with the up per fluted cylinder and vertical tongued bars, b, and operating substantially in the manner and for the purpose as herein set forth.

56,366.—POTATO DIGGER.—F. Caldwell, Oxford, Me.

First, I claim the combination and arrangement of the geared wheels, d and c, shaft, e, eccentric, f, and connecting rod, n, as and for the purposes herein described, the said wheel, c, shaft, e, eccentric, f, and the sifter, s, being attached, as set forth, to the tilting frame, F, and the shaft, e, being also employed to give motion to the endless apron, k.

Second, The combination and arrangement of the arms, g h, and helical spring, i, to hold the sifter, as described.

Third, The arrangement of the tilting frame, F, upon the shaft, E, for the purpose herein set forth and described.

56,367.—TEAPOT.—Robert Carter, San Francisco, Cal.

First, I claim the bottom, n n, figure 2, of the inner case, H, figure 2, being formed convex toward E, figures 1 and 2, the bottom of the outer case, D, figures 1 and 2, for preventing the violent ebullition of the water contained in K K K, figure 2, when boiling, as would ensue if the bottom of H, figure 2, was flat.

Second, And without confining myself to any particular shape, size, or material, I claim as mine the general combination of the two cases, with their surroundings and appurtenances, as in this specification shown, for the purposes described and in the manner substantially herein set forth.

56,368.—IMPLEMENT FOR OPENING SHEET METAL CANS.—Seth P. Chapin, Atlantic, N. J.

I claim the cutter, B, curved in its cross section and provided with sloping cutting edges a' or a2 as described, when secured upon a handle or stock provided with a shoulder, d, to operate substantially as herein set forth for the purpose specified.

56,369.—SKATE.—E. G. Chormann, Philadelphia, Pa.

First, I claim the combination of the plate, A, and its runner, C, the plate, A', and its runner, C', and the screw, B, and sliding block, c, or equivalent device whereby the runners may be adjusted at any required distance from each other, the whole being constructed and arranged substantially as described.

Second, The combination, substantially as illustrated in figure 4, of the adjustable plates, A A', with the rollers for the purpose described.

56,370.—MACHINE FOR SHELLING PEAS.—George Clark, Jr., Boston, Mass.

I claim the combination of rotating rollers, face plate and screw clamp, whether with or without the scraper, for the purpose of expressing peas and other seeds from their containing vessels when the same are constructed and used substantially as described.

56,371.—CAR COUPLING.—D. Clinton, Peoria, Ill.

I claim the combination of the oblique faced hook, B, spring, c, and eye, E, the latter serving as a stop for the end of the spring, and constructed and arranged to operate together in the manner and for the purposes herein specified.

56,372.—CORDAGE MACHINE.—Charles Cobb, Plymouth, Mass.

I claim the combination and arrangement of the self-adjusting guide with the layer arm and the notch thereof, such guide being to operate with the laying drum substantially as set forth.

56,373.—SPRING BED BOTTOM.—Alexander Cole, Lockport, N. Y.

I claim the combination of the slats, C C, hangers, E, guide rods, c c, coiled springs, s s, and stops or cross pieces, H H', the whole arranged and operating substantially in the manner and for the purpose set forth.

56,374.—CHURN DASHER.—E. G. Connelly, Jasper, Ind.

I claim the construction of the dasher, C and C', with the valves, g and g', with either a double or single dasher, operating in the manner and for the purpose substantially as set forth in the above specifications.

56,375.—HORSE HAY FORK.—A. J. Cooley, Chardon, Ohio.

First, I claim the arrangement of the arms, C, shanks, A A', and links, a, with the catch, F, spring, d, and notch, c, as and for the purpose substantially as set forth.

Second, The hooks, B' B'', with the connecting ropes or chains in combination with the loops, G G', shanks, A A', and bands, D, substantially as and for the purpose set forth.

56,376.—INVALID BEDSTEAD.—Henry Cordes, Bellville, N. J.

I claim an invalid bed formed by combining the pipes, B and G, the plates, E C D and I, the sheet, F, valve, G, and spring, L, with each other, and with the bed or mattress, substantially as described and for the purpose set forth.

56,377.—TOOL HOLDER.—Francis T. Cordis, Longmeadow, Mass.

I claim as a new article of manufacture, the holder, constructed substantially in the manner herein set forth.

56,378.—APPARATUS FOR TREATING ORES.—J. C. Coult and J. Roach, San Francisco, Cal.

First, We claim the pipe, C, connecting with a furnace, and having a wide opening entering the condenser, E, thereby imparting a greater distribution of the fumes as they enter said condenser, or water tank, and equally spreading the fumes over the water, substantially as described and for the purposes set forth.

Second, We claim the tank, E, with an inclined bottom, and the partitions, b b b, in the inverted tank or cover of the same, and the adjusting screws, F F, attached thereto, substantially as described and for the purpose set forth.

Third, We claim the perforated diaphragm, G, having sufficient openings to equal the opening of pipe, C, where it enters the condenser, E, as before stated; likewise the water bottom, G' and G', over which the fumes collect and are drawn into a fan or pump; also giving a water bottom, H, to the fan or pump, thereby bringing the fumes again in contact with the water for a long distance, and extracting all that it may be desirable to collect before allowing an escape into the chimney, substantially as described and for the purposes set forth.

56,379.—STOVEPIPE DAMPER.—B. F. Cowan, New York City.

First, I claim the rotating spheroidal valve damper above shown, constructed and operating substantially as described.

Second, I also claim the rotating damper above shown in combination with openings in both sides of that part of the pipe within which the damper revolves, substantially as described.

56,380.—PUMP FOR DEEP WELLS.—Benjamin Crawford, Allegheny, Pa.

First, I claim the detached rod, t, in combination with the lower valve, q, for the purpose of keeping the lower valve closed on the down stroke of the piston.

Second, The combination and arrangement of the lever, y, and valve rod, t, with the cam, a', and pendant, d', for raising and lowering the valve rod, t, to relieve the lower valve, q, of its pressure when the up-stroke begins, and hold it down on the commencement of the down stroke, substantially as described.

Third, The combination of the check valve, h, and gas pipe, j e, with the working valve of a pump, constructed and arranged substantially as and for the purposes hereinbefore described.

Fourth, In its arrangement with the devices described in the third claim, the trap, c, in the flow pipe to prevent the passage of gas in that direction, substantially as described.

56,381.—WOVEN FABRIC.—George Crompton, Worcester, Mass.

I claim a textile fabric, woven with braided threads, substantially as described.

56,382.—EGG BEATER.—Joshua Davis, Schenectady, N. Y.

First, I claim an eccentric beater in combination with a revolving pan or vessel, substantially as and for the purpose set forth.

Second, The three bevel wheels, B C E, of differing diameters, one of which is adapted for carrying a pan or vessel, in combination with a revolving eccentrically-arranged stirrer or beater, substantially as described.

56,383.—SYSTEM OF CUTTING DRESSES.—Catharine Dittenhafer, Canton, Ohio.

I claim the within described patterns and system of cutting ladies' and children's dresses, sacques, and basques, when used in the manner substantially as herein specified.

56,384.—SLIDE VALVE.—John B. Dougherty, Rochester, N. Y.

First, I claim the arrangement of the exhaust port, e, inlet ports, a a and m, in combination with the rollers, r r, and the steam pipe, p, which combination and arrangement avoids the necessity of a relieving or balance plate.

Second, The combination of the rollers, r r, in slide valves, with the bars, f, when the same are used without a steam chest, as and for the purposes shown and described.

56,385.—SLIDE VALVE.—John B. Dougherty, Rochester, N. Y.

I claim the arrangement of the ports, c and e, in combination with one or more ports through the relieving plate, P, and the exhaust port, a, substantially as and for the purposes set forth, when the valve is used without a steam chest.

56,386.—ELEVATOR BUCKET.—Henry Dover and James Storms, Buffalo, N. Y.

We claim an elevator bucket constructed as herein described.

56,387.—PUMP.—Samuel S. Durbon, Lebanon, Ind.

I claim the tubular valve seats, 6 6, the spindle gum valves, 7 7, the self-adjusting leverage, 13, with valves, 15 15, the self-adjusting gum piston, composed of 1 2 and 3, and the elliptic, L, with the eccentric, L', all arranged and operating substantially as and for the purpose set forth.

56,388.—FLASK FOR CASTING STEEL INGOTS.—Zoheth Sherman Durfee, Pittsburgh, Pa.

I claim as my invention the mode of casting ingots of steel or other metals, by pouring or tapping such metal upon a piston, in a mold so arranged and constructed that, as the metal is continuously introduced, the piston may be caused or permitted as continuously to descend and be followed by the metal, while at the same time, the metal already poured, or the greater part thereof, remains at the same, or nearly the same hight in the mold, that portion successively being introduced flowing through that already poured, and folding outward against the surface of the mold, at or near the surface of the piston as the piston gradually descends in the mold.

56,389.—HARVESTING MACHINE.—Rufus Dutton, New York City.

I claim the construction and arrangement of the track-board cap, D, in combination with the grass shoe and its projecting spur, a, and the track board and its spur, c, the whole arranged and operating substantially as and for the purposes set forth.

56,390.—FRUIT CAN.—B. F. Ells, Dayton, Ohio.

I claim the flanged top, A, provided with sealing wax, as set forth, and used with the can, B, in the manner and for the purpose described, whereby a can is formed which, when filled with fruit, will seal itself, substantially as specified.

56,391.—BOOTS AND SHOES.—Martin E. Ethridge, Lock Mills, Me.

I claim the combination, as well as the arrangement, of the two welts, a b, with the insole, B, the upper, and the outer sole, D.

I also claim the combination and arrangement of the metallic cap sole, E, with the wooden outer sole, D, the two welts, a b, the insole, B, and the upper, A, arranged and applied together, substantially as set forth.

I also claim the arrangement and combination of the cushion, C, with the insole, B, outer sole, D, and the upper, A, disposed together, substantially as set forth.

I also claim the combination of the perforated cap sole, E, and the gutta-percha sole, E', or its equivalent, applied to the wooden outer sole, D, as set forth.

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I also claim the combination and arrangement of the layer, d of shellac, or its equivalent, with the wooden sole, the two welts, the insole, and upper, arranged and applied together substantially as explained.

56,392.—GATE.—Simeon F. Emerson, Seville, Ohio.

First, I claim the horizontal arm, E, of the pivoted hinge, C, operating with the top board, D, of the gate, substantially as described and for the purposes set forth.

Second, The combination of the roller, H, and the arms, G, having projecting ends or lugs, with the top rail, I, of the fence, and with the top board, D, of the gate, substantially as described, and for the purpose set forth.

Third, The combination of the guide bar, K, and arms, J, with the post, A, and with the gate, substantially as described and for the purpose set forth.

56,393.—MACHINE FOR MAKING CORDED BINDING FOR INDIA-RUBBER AND OTHER FABRICS.—Chas. A. Ensign, Naugatuck, Ct.

What I claim is an organized, automatically-operating machine, substantially such as described, for making binding for india-rubber, or other fabrics.

56,394.—LOCK.—Philo S. Felter, Cincinnatus, N. Y.

I claim, First, The combination of the wheels, E and F, tumbler, D, and key-hole guard or cover, C, arranged and operating together, substantially as described and specified.

Second, The combination of the wheels, E and F, tumbler, D, key-hole cover, C, with the arbor, H, and dial, G, arranged and operating substantially as described and specified.

Third, and in combination with the subject-matter of the above, I claim the detachable plate, K, arranged as described, for operating the lock without recourse to the numbers of the set by which it is locked, substantially as described and specified.

56,395.—OPERATING ORDNANCE.—John H. Field, Saugerties, N. Y.

I claim the combination of the circular rack, D, and endless screw, G, mounted on an eccentric shaft, g, and operated by levers and the double-acting pawls, h h, substantially as and for the purpose herein specified.

56,396.—STEAM GENERATOR.—Matthew Fletcher, Louisville, Ky.

First, I claim the arrangement of the vertical steam boiler, with the round pan, I, and water leg, a, as herein described, and for the purposes set forth.

Second, I also claim the cone, M, in the chimney, d, substantially as described, and for the purpose set forth.

56,397.—HARVESTER.—Elias T. Ford, Stillwater, N. Y.

First, I claim the frame, C, hinged to the front extremities of arms, D D, in combination with the rod, E, adjusting bar, F, and pole-section, Q, embracing the tube, B, substantially as described.

Second, I claim the left arm, D, forming the pillow block or frame, constructed as described, and provided with the bearings, e f, hanger, R, and universal box, S, and arranged in relation to the tube, B, and frame, C, substantially as described.

Third, I claim the lever, K, constructed as described, and pivoted at v v, to standards on the shoe, L, in combination with the flange tops, v3 v3, formed on said standard, in the manner and for the purpose specified.

Fourth, I claim the arrangement of the adjustable rod, F, hanger, R, box, S, bar, E, lugs, V V, shoe, L2, and lever, a, in combination with the tube, B, arms, D D, and frame, C, in the manner and for the purpose herein specified.

56,398.—RUBBER ROLLERS FOR WRINGING MACHINE.—James B. Forsyth, Roxbury, Mass.

I claim curing rollers of india-rubber, or other vulcanized gum, on a hollow core, substantially as and for the purpose described.

56,399.—BREECH-LOADING FIRE ARM.—Geo. P. and Geo. F. Foster, Mohawk, N. Y.

We claim the pintle, K, constructed and operated substantially as described, that is to say, being forced to the rear by the back pressure of the cartridge in loading, driven forward by the impingement of its rear end upon a projection on the abutment, or its equivalent, and sustained by the spring, L, in the annular groove, in position to hold the cartridge case free for subsequent retraction or ejection.

56,400.—SPITTOON FOR RAILROAD CARS.—F. H. Furniss, Crestline, Ohio.

First, I claim constructing a spittoon with a valve seat, C, and valve, C', as set forth.

Second, I claim the stem, B', and spring, D, in combination with the valve, C', and body, B, as and for the purpose herein set forth and described.

56,401.—HORSESHOE.—E. C. Gero, Galesburg, Mich.

I claim the shoe, d d, with spring, a, springs, b b, and pads, c c, constructed and used substantially as and for the purposes herein set forth.

56,402.—BAG HOLDER.—Cyrus F. Gillett, Sparta, Wis.

I claim the ring, C, applied within the funnel, A, for the purpose of holding the upper end of a bag, substantially in the manner described and shown.

56,403.—MACHINE FOR GRINDING CUTLERY, ETC.—Russell S. Gladwin, Meriden, Ct.

I claim, in combination with a revolving grindstone and roller, or its equivalent, placed opposite its grinding point, an interspersed table, with suitable recesses for holding the knife or other blank to be ground, and series of cams under said table, and operating in connection with the stone and the roller, substantially in the manner and for the purpose set forth.

56,404.—STEAM ENGINE.—H. Goodrich and G. R. Edwards, Shawneetown, Ill.

We claim the combination and arrangement of the movable piston heads, 8 8 8, with the piston rods, 12 12 12, ports, A A and B B, with the tubes, C C, pitmans, 4 5 6, and rock-shaft arm, 1, substantially in the manner and upon the principle as herein set forth.

56,405.—Suspended.

56,406.—IMPLEMENT FOR STRIPPING AND CUTTING SORGHUM.—James Guckian, Camden, Ohio.

I claim an implement for stripping and cutting sorghum, and other analogous uses, constructed with a fixed blade, B, a movable blade or jaw, C, and a lever, D, or its equivalent, said parts being respectively constructed, and the whole combined for use, substantially as set forth.

56,407.—MUSICAL ATTACHMENT TO BIRD CAGES.—G. Gunther, New York City.

I claim the application to a cage, A, of a musical device, such for instance as an ordinary music box, in combination with a suitable lever, b, and bar, c, substantially as and for the purpose described.

56,408.—COAL HOD.—E. R. Hall, Buffalo, N. Y.

I claim the spout, B, constructed substantially as described, in combination with the cover, C, and bail, D, provided with cross-wire, e, or its equivalent, arranged and operating as set forth.

56,409.—STEAM SAFETY VALVE.—Edward Hamilton, Chicago, Ill.

First, I claim the combination and arrangement of the valve, e, provided with the stem, F, spiral spring, a, and set screw, E, with the case, D, all located within the case, A, as shown and described.

Second, In combination with the valve, e, arranged as set forth, I claim the lever, G, arranged to operate as set forth.

56,410.—FOLDING CHAIR.—B. J. Harrison and J. Condie, New York City.

We claim the transverse bar, G, so arranged in relation with the pivoted back seat rail, C, the back, E F, and the legs, B, as to serve as a brace to hold the back in position when the chair is opened, and as a handle by which the chair may be carried when closed, substantially as herein set forth.

Second, A folding chair of the crossed legs, B A, flexible seat, D, back, E F, pivoted back seat rail, C, and transverse bar, G, the whole constructed, combined, and arranged substantially as herein set forth.

56,411.—RAILROAD.—C. T. Harvey, Tarrytown, N. Y.

First, I claim a coupling clutch for connecting the car, or other vehicle or body, to a moving cable which is jointed so as to be capable of opening and releasing the cable, and has its divisions which clasp the cable or the heads thereof, so shaped as to become of less diameter toward the forward end, substantially as described.

Second, I claim jointing the divisions of that part of a clutch which engage the cable so that they can be raised separately clear of the cable guide, substantially as described.

Third, I also claim a coupling clutch whose divisions swing on the rod on which the clutch slides in combination with springs, I I', or their equivalents, whereby the clutch, and the vehicle are relieved from sudden shocks when connected to a moving cable, substantially as set forth.

Fourth, I also claim the pendulous buffers for bringing a clutch into engagement with the cable, when the clutch is made in two or more parts, substantially as described.

Fifth, I also claim the cam shafts and their cams, G, in combination with the buffers, substantially as shown.

Sixth, I also claim hinging the divisions of a divided clutch upon a rod or shaft parallel with the length of the car or other vehicle to which it is applied, substantially as described.

Seventh, The use of a hollow coupling clutch which connects a car or other vehicle to a moving cable, by embracing or straddling the cable and its ferrules, in combination with a shaft on which it slides, substantially as described.

Eighth, Placing an elastic cushion or cushions, or their equivalents, in the interior of the heads or ferrules of a moving cable, when such ferrules are jointed, substantially as described.

Ninth, Giving a conical form to that part of the clutch which enters into the cable guide, so that when it receives one of the ferrules of the cable it lifts it out of frictional contact with the guide, substantially as described.

Tenth, Making the ends of the ferrules of the cable of conical form, substantially as described.

56,412.—GATE.—C. P. Hawley and E. B. Murdock, East Galway, N. Y.

I claim the levers, J K H L M, and connecting rods, N O R S and T U V W, constructed and arranged as herein described, in combination with each other, with the supporting posts, A B C, and with the gate, G, substantially as herein described and for the purpose set forth.

56,413.—COMBINED PIANO, COUCH, AND BUREAU.—Charles Hess, Cincinnati, Ohio.

I claim a combination of piano, couch, and bureau, arranged and operating substantially as represented and set forth.

56,414.—PISTON FOR DEEP-WELL PUMPS.—J. W. Hoagland, New Brunswick, N. J.

I claim the combination of valve, G, rod, C, shoulder, B, neck, D, guards, I, and walls, E, arranged with a pump cylinder, and operating in the manner and for the purpose herein specified.

56,415.—ERASER.—A. H. Hook and H. B. Adams, New York City.

We claim forming erasers substantially as and for the purposes herein described.

56,416.—STEAM WATER-POWER DEVICE.—W. L. Horne, Batavia, Ill.

I claim the arrangement and combination of the float, d, chamber, S, condenser, n, perforated pans, y and q, slats, p, and connected by pipes, u and r, as herein described and for the purpose set forth.

56,417.—FIRE ESCAPE.—W. L. Horne, Batavia, Ill.

I claim the arrangement and construction of the windlass, E, with its ropes, H and J, square frame, C, with its rollers, G, when arranged and combined to operate as herein described.

56,418.—ROLLER FOR CLOTHES WRINGERS, WASHERS, ETC.—R. B. Hugunin, New York City.

I claim the elastic rollers herein described, made by vulcanizing rubber or equivalent gum, upon raw rubber, prepared cloth, or wire cloth, or both combined, the cloth being first wrapped around the central core, and the rods or their equivalents secured within the said cloth and grooves of the core, substantially in the manner and for the purposes specified.

56,419.—LATHE FOR TURNING WHIP STOCKS.—Liveras Hull, Charlestown, Mass.

I claim, for the purpose set forth, the combination as well as the arrangement of the two adjustable pattern bars, I K, the furcated levers, G H, the carriage, F, its ways or guides, E E, the mandrel, A, and chuck, C, or the equivalent of the latter, the cutter, q, and the self-adjusting Y piece, b; and I also claim the combination of the same and the slide, l o.

I also claim the combination and arrangement of the adjustable throat lever or piece, s, with the cutter, q, when applied to the upper furcated lever, so as to be adjustable thereon, as specified.

56,420.—PISTON.—Lafayette Huntoon, Milford, Mass.

I claim the combination of the separate springs, C C, with a connection, G, or its equivalent, substantially as described, whereby half of the excess of pressure of one spring may be transferred to the other, so as to equalize the pressure of both on the rings, as specified.

56,421.—NEEDLE FOR CANING CHAIRS.—Mrs. Mary E. Hurley, Baltimore, Md.

I claim a needle, A, for caning chairs, having an eye, b, through the front end, a, constructed and operating substantially as shown and described and for the purpose set forth.

56,422.—ADJUSTABLE STORE SHELVES.—S. L. Latta, Ligonier, Ind.

I claim, first, The adjustable cleats, C, and thumb-screw rods, E, operating on beveled guides, D, for the adjustment of the shelves, A A, substantially in the manner and for the purpose as herein specified.

Second, The screw lever rod, F, and screw nut, G, as arranged in connection with the shelves and operating in the manner and for the purpose substantially as herein specified.

56,423.—COMBINED STOVE HOOK, HAMMER, ETC.—Theodore C. Law, Green Island, N. Y.

I claim the household implement, combining the appliances, substantially as described.

56,424.—CUTTER FOR WOOD-PLANING MACHINES.—Chas. Livingston, Redwood City, Cal.

I claim the arrangement of the cutters, C and G, upon a suitable cutter head, having a wedge-shaped center piece, B, substantially as and for the purpose described.

56,425.—CHURN.—T. E. Lockwood, Cincinnati, O.

I claim the arrangement of spur wheel, F, pinion, E, crank shaft, D, and pitman, G, in combination with the adjustable lever, I, when provided with the series of apertures, K L and M, all arranged to operate substantially as and for the purpose herein described and set forth.

56,426.—SAWING MACHINE.—Donald R. MacLennan, Cincinnati, Ohio.

First, I claim the rocking socket, G, mounted directly on the drawing shaft, A, in combination with the guide rod, F, for the purposes specified.

Second, The arrangement of the lever, L, removable bracket, N, socket, n, rod, M, and roller box, K, relatively to each other and to the sawing apparatus, A B C D E, as and for the purposes set forth.

56,427.—ARTIFICIAL HAND.—J. F. Maguire, East Boston, Mass.

I claim connecting the fingers, D, of the hand, to and with the slide, R, having thumb nut, U, through angular lever arm, N, connecting rod, L, and cross head, F I, substantially as herein described and for the purpose specified.

In combination with the above, I also claim connecting the thumb, V, with the slide, R, through a spring arm, W, substantially as and for the purpose described.

56,428.—STRAW CUTTER.—Joseph Marchant, Cambridge City, Ind.

I claim the arrangement and combination of the balance wheel, A, adjustable plate wheel, B, thumb screw, C, rod, E, pawls, F and G, ratchet wheels, H H, and rocker arm or shaft, I, constructed and operating substantially as and for the purposes set forth.

56,429.—FURNACE FOR PUDDLING, HEATING, ETC.—Oscar F. Mayhew (assignor to W. H. Weeks, and G. M. Levette), Indianapolis, Ind.

First, I claim the construction and arrangement of the throat or opening, C, and air passages, F and H, when placed in such relation to the incandescent fuel as to operate in the manner and for the purpose substantially as set forth.

Second, The damper, G, in combination with the air passage, F, and throat, C, when arranged as and for the purpose substantially as set forth.

Third, The zig-zag divisions of the air passage, F, in combination with the throat, C, when arranged as and for the purpose substantially as set forth.

Fourth, The upper air passage, H, in combination with the throat, C, when arranged as and for the purpose substantially as set forth.

56,430.—MACHINE FOR PLANTING COTTON SEED.—I. W. McGaffey, of Chicago, Ill.

I claim, First, The rotating flanges in the seed box, for moving and agitating the seed, constructed and arranged in the manner and for the purposes specified.

Second, I claim the rotating fingers in combination with the flanges or agitators in the seed box, arranged and operated as shown.

Third, I claim the construction, arrangement, and combination of the fingers and adjustable slide for regulating the quantity of seed discharged, substantially as specified.

56,431.—EXTRACTING BUNGS FROM BARRELS.—Henry Myers, Hyde Park, and A. Webb, Scranton, Pa.

We claim a bung, A, provided with a staple, b, and depression, d, as a new article of manufacture.

Also, the hook, d, in combination with a screw or lever, and with the staple, b, in the bung, A, substantially as and for the purpose set forth.

56,432.—RAILROAD SWITCH.—T. S. Mitchell, Pittsburg, Pa.

I claim, First, The automatic switch-moving apparatus composed of the bar, D, links, E F H, bar, I, levers, R R, shafts, r r, arms, S S, frames, T T, and weights, U U, or their equivalents, when they are arranged and operating as specified.

Second, The pieces of steel, V V, in combination with the rail, a', and frame, T.

Third, Operating a switch automatically by the action of the weight of the train itself on the frames, T T, in the manner described and for the purpose of preventing such train from running off the track.

56,433.—QUARTZ MILL.—Albert Moore, San Francisco, Cal.

First, In combination with the radial feeding furrows, B B B'. I claim the plain surface beyond the ends of the furrows, substantially as described, for the purposes set forth.

Second, I claim the manner of breaking the joints in constructing and laying the shoes and dies, so that no continuous straight lines shall be employed from the feed center of the muller to its circumference, substantially as described and for the purpose set forth.

56,434.—BROOM HEAD.—W. B. Moore, Philadelphia, Pa.

I claim the combination of the cam or eccentric roller, with the bow, and with a lever for turning said roller to clamp the broom corn or other material between the bow and cam roller; and this I claim whether the lever for turning the roller be the screw for holding the broom, cap, and handle together, or whether it be a separate or removable lever, substantially as described.

56,435.—PUMP FOR DEEP WELLS.—W. E. Morrison and W. L. Betts, Funkville, Pa.

We claim attaching to the piston, or sucker rod of a pump, and above the upper valve, secured to it, a perforated receiver, substantially as herein described and for the purpose specified.

56,436.—SOUNDING APPARATUS.—S. E. and G. L. Morse, Harrison, N. J.

We claim, First, arranging fluids of different specific gravities in a vessel or vessels, so that when sunk in water, or submitted to pressure otherwise, a mark of the amount of compression of one or more of these fluids at the greatest depth, or at the point of greatest compression, is retained for inspection on the return of the instrument to the operator, substantially as described.

Second, We also claim the arrangement of two liquids having unequal specific gravities, with a meter tube, in a vessel closed except at one end of the meter tube, in such a way that external pressure, caused by the descent of the instrument in water, or otherwise, will force a portion of the lighter liquid through the heavier liquid, into the body of the vessel, to supply the vacancy there made by the compression of its contents, and that then, under a relaxation of the external pressure, caused by the ascent of the instrument in water or otherwise, the expansion or reaction of the liquids in the body of the vessel will force the heavier liquid into the meter tube, to the amount of the compression, thus forming a meter of the compression, and, by inference, of the greatest depth to which it has descended, substantially as described.

Third, We also claim the introduction of a minute quantity of air or other elastic fluid, into the vessel containing the liquids, as described in the clause next preceding, to make the instrument sensitive as a meter of depth in comparatively shallow water.

Fourth, We also claim the application to the bathometer of a meter tube, so constructed that the liquids can easily pass each other in the bore of the said meter tube, thereby enabling the operator to restore them to their original position for a new operation merely by turning the instrument, substantially as described.

Fifth, We also claim attaching a bag of india-rubber, or other suitable flexible material, to the outer end of the meter tube, for the purpose of preserving the exact quantities of the fluids in the vessel, as at first adjusted, and of enabling the operator, by pressure upon the bag, to discharge the contents of the meter tube into the vessel, and therefore to use a meter tube of small bore, substantially as described.

Sixth, We also claim attaching a buoy and weight to a bathometer in such a way that when the instrument, or its appendage, touches the bottom, the weight shall be detached, and allow the buoy to carry the instrument to the surface, substantially as described, thereby dispensing with a line.

Seventh, We also claim the method of releasing a submerged buoy, by causing a small weight attached to the long arm of a lever, to support on the short arm the larger weight, which sinks the buoy, till the smaller weight, touching the bottom, is supported thereon, thus causing the short arm, no longer counterpoised, to fall and discharge the greater weight, substantially as described.

Eighth, We also claim attaching to a bathometer a rod or pole in such a way that on its return to the surface of the water, it will attract attention at a distance so as to facilitate the recovery of the apparatus of which it forms a part, substantially as described.

56,437.—SCAFFOLD.—P. Newbanks, and H. M. Powel, Lincoln, Ill.

We claim the brackets as constructed in combination with the scaffold board, A, and traces H and G, the same being used substantially in the manner and for the purpose herein specified.

56,438.—STAYS, SPRINGS, AND EXTENSORS IN WEARING APPAREL.—J. L. Newton, Boston, Mass.

I claim as a stay, extensor or spring, in wearing apparel, raw hide cut in strips or otherwise adapted for giving stiffness to and supporting corsets, stays, waists, and skirts of dresses and other articles of wearing apparel, as and for the purpose above set forth.

56,439.—HORSE HAY FORK.—Frederick Nishwitz, Willliamsburg, N. Y.

First, I claim the combination with the shank, the tine and the traversing bar of the sliding collar, G, all arranged and operating substantially as described.

Second, I claim the combination with the shank and traversing

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bar of the locking lever, when constructed and arranged as and for the purpose described.

56,440.—HORSE HAY FORK.—F. Nishwitz, Williamsburg, N. Y. and B. S. Heyers, Pekin, Ill.

First, We claim the combination in a horse hay fork of two S-shaped prongs or tines pivoted near their centers to move in parallel planes, so arranged that when entering the hay, the lower arms of the tines unite to form a spear to penetrate more easily, and when expanded, the hay is grasped in two separate bundles between the lower arm of one prong and the upper arm of the other respectively, substantially as described.

Second, The arrangement of the tines, pivoted on opposite sides of the rigid shank or draw-bar, as described, for the purpose of avoiding clogging.

Third, The combination of the tines, pivoted to the shank with the sliding collar, toggles and stops, substantially as described, for the purpose of locking the tines when hoisting.

Fourth, The combination with the shank, the tines and the sliding collar, and the toggle links, when arranged to operate as a stop to limit the backward movement of the tines in entering the hay, substantially as described.

56,441.—FENCE.—A. W. Olds, Green Oak, Mich.

I claim the braces, E E, when secured to the uprights, B B, as described, in combination with the upper rail and binding wire, H, as and for the purpose set forth.

56,442.—WASHING MACHINE.—Norman Olin and E. L. Hopkins, Homer, Mich.

We claim the combination with each other of the endless belt or apron, D, passing over the rollers, B, the rubber, E, shaft, F, carrying the rollers, G G', and the springs, I I, arranged and operating substantially as described.

56,443.—MACHINE FOR FOLDING FLEECES OF WOOL.—John Porter, Ruggles, Ohio.

I claim the sectional table, B B', C C', and leaf, L, in combination with the brace, G, strap, L, and roller, E, when arranged in the manner and for the purpose set forth.

56,444.—ROOFING CEMENT.—Wm. L. Potter, Clifton Park, N. Y.

I claim an improved composition for roofing and similar uses, formed by mixing raw coal tar and powdered clay with each other, substantially in the manner described and for the purpose set forth.

56,445.—TENON MACHINE.—William Pruet, Kokomo, Ind.

I claim, First, The hereinabove described device for feeding the tail block toward the cutters with the upward motion of the cross head, by means of the lever, G, cam lever, C, rod, P, teeth, Q, and pawl, P', attached to the tail block, N, the said several parts being constructed, and the whole arranged for use, substantially as set forth.

Second, In combination with the knives, L and K, so arranged as to cut the shoulders and sides of the tenon at the same time, I claim a device for giving a forward feed to the tail block, actuated by the same lever that communicates motion to the knives, substantially in the manner set forth.

56,446.—BROOM HEAD.—M. Quinby and J. C. Sturdevant, Skinner's Eddy, Pa.

We claim the movable jaw, H, furnished with a hinge, A, and a shank, C, in combination with the stationary jaw, G, binders, D D, and screw, B, as described and for the purposes set forth.

56,447.—HAT.—C. L. Rahmer, Brooklyn, N. Y.

I claim the combination of the band, a, and bent arms, v, with the sweat lining, B, applied to the hat, A, forming the space, f, all in the manner and for the purpose herein specified.

56,448.—SOCKET COUPLING FOR GAS FIXTURES.—Thomas L. Reed, Providence, Rhode Island. Antedated July 13, 1866.

I claim forming the packing of the coupling with two flanches and an intervening space externally, and a swelling ridge, internally, substantially as described for the purpose specified. I also claim making that flanch of the packing by which it is confined in the shell of some comparatively inelastic material, substantially as and for the purpose specified.

56,449.—CLOTHES WRINGER.—Orrin Reeves, Greenport, N. Y.

I claim the steel springs, S S, and the adjustable journal box, g, the rollers, G G, and friction rollers, B, the several parts being constructed, combined and arranged, as and for the purpose herein described and represented.

56,450.—PADLOCK.—Cyrus W. Saladee, Newark, Ohio.

First, I claim as constructed the tumbler, "A" with the guard ring, C, attached as described, and operating as set forth, in combination with the spring, E, for the purposes set forth and described.

Second, I claim the key stud, X, and short stud, S, on tumbler, "A" constructed as described and for the purposes set forth.

56,451.—PADLOCK.—Cyrus W. Saladee and William Armstrong, Newark, Ohio.

First, We claim the wheel hasp, A, or its equivalent, constructed and operating in the manner and for the purpose substantially as shown and described.

Second, We claim the center pin or pivot, C, in combination with the wheel hasp, A, in the manner and for the purpose substantially as shown and described.

Third, We claim the shoulder, H, or its equivalent in combination with the hasp, A, spring, B, or its equivalent, in the manner and for the purpose substantially as shown and described.

Fourth, We claim locking the wheel hasp, A, by taking hold of the notch, O, or its equivalent, in the manner and for the purpose substantially as shown and described.

56,452.—SAFE.—Rufus S. Sanborn, Ripon, Wis.

First, I claim the combination of the case, A, with the cylinders, B C D, constructed and arranged substantially as and for the purpose herein specified.

Second, The use of the vessels for holding water when used in connection with the cylinders as herein fully set forth.

Third, The arrangement of the box, E, with the cylinders and outer case, A, substantially as and for the purpose herein set forth.

56,453.—MANUFACTURE OF LAGER BEER.—John Schneider, Williamsburgh, N. Y.

First, I claim the above described process and production of an improved lager beer, substantially as described and set forth.

Second, I claim the peculiar manner of extracting the essence or flavor of hops by means of the boiling wort or unfermented beer, and mixing the same with the fermented beer for the purpose substantially as set forth and described.

56,454.—COMBINED SEEDER AND CULTIVATOR.—Silas C. Schofield, Freeport, Ill.

First, I claim the bifurcated double cam rod, H h h, suspended by a swinging link, k, and operated by an odd number of pins, i i, substantially in the manner and for the purpose set forth.

Second, I claim the combination of the agitating rock shaft, J, with an actuating cam rod, H, substantially in the manner and for the purpose specified.

Third, I claim the compound lever, M m, for operating the seed slide, r, as herein shown and explained.

Fourth, I claim the stay braces or re-enforcing rods, e e, in combination with extended axle ends, f f, when employed as draft wrists for attaching the outside plow beams, E E, substantially in the manner and for the purpose set forth.

56,455.—PEN AND ERASER COMBINED.—Joseph Schott, Chicago, Ill.

I claim the combination of the folding drawing pen with sliding eraser, the whole arranged as above described and for the purpose herein specified.

56,456.—BALING PRESS.—Leopold Seeberger, and N. Levy, Cincinnati, Ohio.

We claim, First, The provision in a baling press of the sliding shaft J, so arranged as to allow a fast or slow motion of the follower, by coupling or uncoupling a train of spur wheels, D E F G, and pinions, c d e f g, in the manner described and set forth.

Second, We claim a baling trunk, all of whose sides, 1, are hinged to the bottom or floor, R, of said trunk, in the manner specified.

Third, In combination with the elements of the clause immediately preceding, we also claim the staples, U, catches, V, and stops, W, all arranged and operating as and for the purpose described.

56,457.—MACHINE FOR POLISHING ENAMELED PAPER.—S. Shepherd and A. M. George, Nashua, N. H.

We claim, First, The combination of the metallic burnishing roller, G, endless apron, F, and table, B, when the burnishing roller revolves at a higher velocity than that of the endless apron, substantially as herein set forth for the purpose specified.

Second, Providing an elastic tie bearing for the paper under the burnishing roller by making either the apron or the table elastic, substantially as herein set forth.

Third, Giving the burnishing roller, G, a reciprocating movement transversely to the endless apron simultaneously with its rotary motion, substantially as herein set forth for the purpose specified.

Fourth, The pressing plate, T, applied in relation with the burnishing roller, G, endless apron, F, and table, B, substantially as herein set forth for the purpose specified.

56,458.—BEVERAGE.—Henry Smith and Hiram F. Snow, Dover, N. H.

We claim a beverage prepared from the ingredients and substantially in the proportions and manner herein specified.

56,459.—HOLLOW AUGER.—J. H. Smith, Pineville, Pa.

I claim the frame or stock A, and the two adjustable jaws, D D', operated by the right and left screw, F, and the cutter, G, all constructed and arranged to operate in the manner substantially as and for the purpose herein set forth.

56,460.—SCREW WRENCH.—Atkins Stover, New York City.

I claim, First, The traveling worm, F, fitted upon the rod, E, and working in a screw thread made upon the back of the bar of the wrench, in combination with the movable jaw, C, and bar, A, substantially as specified.

Second, The combination of the rod, E, worm, F, slot, e, pin, f, movable jaw, C, bar, A, and stationary jaw, B, substantially as shown and described.

56,461.—BROOM HEAD.—W. Paine and R. E. Caviness, Fairfield, Iowa.

We claim the plate, A, having the flanges, a, and the teeth, t, hinged to the handle by means of the staples, C, in combination with the clamps, w, and bolt, D, all arranged as shown and described.

56,462.—HARNESS.—Washburn Peabody, Dixmont Center, Maine.

I claim the arrangement substantially as described of the two rump hooks, A A, with the back strap of a harness, the same being for the purpose specified.

56,463.—ADJUSTABLE HAND CUFF.—O. C. Phelps, New York City.

I claim the spring f, spiral spring, g, and sliding bolt, e, arranged so that said bolt shall catch into notches on the inner or concave side of the bow, or long section, a, substantially as described.

56,464.—EVAPORATOR.—E. W. Taylor, Franklin, Ind.

I claim the reversing of the heat from the furnace, which heat plays on the bottom of the pan and passes through the pan, C, by means of small flues.

I claim the regulating of the heat by means of the shut-offs H and N.

I also claim the drum, E, and the movable connection flues, L L and c, and the stationary ones, M M and c.

56,465.—PORTABLE PICKET FENCE.—A. L. Thorp, Vandalia, Mich.

I claim the slots, a, in the rails, A, as constructed, and the picket, b, as arranged therein, in combination with the cross-pieces, D, as constructed, substantially in the manner and for the purpose as herein set forth.

56,466.—REVOLVING FIRE-ARM.—William Tibbals, South Coventry, Conn.

First, I claim recessing the front face of the breech, B, to receive the smaller rear end of the cylinder, D, when said recess is provided with the annular flange, c, substantially as shown and described.

Second, I claim the removable anvil, a, or its equivalent, when constructed and arranged to operate as and for the purpose set forth.

Third, I claim the annular flange, c, or its equivalent, whether used with or without the anvil, a, for the purpose of holding the cartridge in the cylinder, as described.

56,467.—RAILROAD-STATION PUMP.—A. W. Todd, Chicago, Ill.

I claim the arrangement of the cylinder, B, with the stay rod, I, cork, n and o, cock, E, spigot, J F, handle, H, being secured to the cylinder B at K, pipe, C, substantially upon the principles, and in the manner herein set forth.

56,468.—PUMP.—F. W. Tully and T. Reece, Philadelphia, Pa.

First, We claim the combination of the disk, I, with its slots, L L', blocks, l l,' and vibrating link, N, with a single or double-acting lift and force pump, constructed substantially in the manner set forth.

Second, The crab or saddle, D, with its fixtures, d and e, in combination with the foregoing, and with the pipe, C, for attaching and giving support or steadiness to the pump, substantially as described.

56,469.—WASHING MACHINE.—Philip Van Bussum, Henderson, Ky.

I claim the slatted rotating or semi-rotating cylinder, B, in combination with the concave, E, formed of the parts, e e, connected by hinges, f, and attached by hinges, g, to arms, h, projecting from shafts, F F, and having a weight, H, applied, all arranged substantially in the manner as and for the purpose set forth.

56,470.—CALENDAR.—W. Powell Ware, New York City. Antedated June 29, 1866.

I claim the dial b, containing the days of the month in seven radiating columns, the dial, a, denoting the days of the week, and the dial, c, indicating the months, and visible through an opening in the dial, b, when constructed and arranged in the manner and for the purposes herein set forth.

56,471.—BURGLAR ALARM.—R. M. Webb, New York City.

I claim the combination of the tube, E, rod, F, having a swiveled piece, J, and spiral or other suitable spring, H, with the key hole of a lock or door, when arranged together and with regard to such key-hole, and connected to a bell or other alarm, so as to operate substantially in the manner and for the purpose described.

56,472.—MACHINE FOR FLUTING WASH-BOARDS.—Calvin J. Weld, West Wardsboro', Vt.

First, I claim the feeding arm, V, attached to the feeding shaft, P, in combination with the slot, Z, in which it moves, for feeding the blanks for a new cut during the return movement of the carriage, substantially as described.

Second, I also claim the springs, R R, for lifting the carriage out of gear at the end of its forward movement, in combination with the lugs, b b', and slots or recesses, c, in the top rail of the boxes, S S, substantially as described.

Third, I also claim the combination of the springs, R R, for lifting the carriage, with the spring, U, for effecting its return movement, substantially as described.

Fourth, I also claim the stop lever, W', with its stops, W, made and operated as shown, in combination with the adjacent holder, M, substantially as described.

56,473.—STOVE-PIPE DRUM.—C. C. Webber, Calmar, Iowa.

I claim an adjustable pipe, F, operated by the rod, G, or its equivalent, and employed in conjunction with the flues, A B C, and damper, D, to make a direct or indirect communication through the drum, as and for the objects specified.

56,474.—LOOM.—Joseph Welsh, Philadelphia, Pa.

I claim giving the described different motions to the heddles of the loom, for the purposes specified, by means of the hooked cords or straps, A B, on the roller, C, or their equivalents, operating in combination with the pulley, E, or its equivalent, substantially as and for the purposes described.

56,475.—HORSESHOE.—Albert S. Wilkinson, Pawtucket, R. I.

I claim the combination of the shoe, A, and web, B, having its inner edges curved, in the manner and for the purpose set forth.

56,476.—HORSESHOE.—Albert S. Wilkinson, Pawtucket, R. I.

First, I claim the metal plates, A a, in combination with the rubber or other elastic sole, D, and rivets, c c', as illustrated by figures 1 and 3, of sheet 1, substantially as described.

Second, I claim the hidden calkins, c' c c, operating substantially in the manner and for the purpose set forth.

56,477.—HORSESHOE.—Albert S. Wilkinson, Pawtucket, R. I.

I claim the bar, A, in combination with the toe clip, a, and heel clips, a1 a2, as indicated in figures 1 and 3, the whole being constructed and operated substantially in the manner and for the purpose set forth.

56,478.—(A)—STENCH TRAP.—F. H. Williams, Syracuse, N. Y.

I claim the siphon, B, provided with a floating valve, E, in combination with the sink or sinks in a house or building and with the pipe or pipes leading to the sewer, substantially as and for the purpose described.

56,479.—(B)—STENCH TRAP.—F. H. Williams, Syracuse, N. Y.

I claim the inclined apron, C, tray, D, and valve, E, in combination with the sink, A, constructed and operating substantially as and for the purpose described,

56,480.—ORE AND TIMBER CAR FOR MINES.—George Williams, Sterling, Colorado.

I claim, First, The construction of the doors with a wider portion, b, to adapt them to be supported by the sides of the car, substantially as described.

Second, A car constructed with end doors adapted to be folded over the top for the purpose of converting it into a timber car.

Third, In combination with the above a trigger C, provided with an inward projection, adapted to be tripped by the post, D.

56,481.—ELEVATOR.—George Williams, Sterling, Colorado.

First, I claim the elevating bucket, E, with the discharging levers, F F, applied to the bottom of the bucket, substantially as described.

Second, And in combination with the above, I claim the deflecting rollers, D, and curved guide ways, K K*, arranged and operating substantially as described.

Third, I claim the adjustable sections, J*, employed to enable the bucket to be discharged at different hights, substantially as described.

Fourth, I claim the hinged shute, O*, in combination with the levers, O2 and p, operating substantially in the manner and for the purpose described.

Fifth, I claim the bucket, E, in combination with the hook, W or its equivalent, the roller, V, substantially as described.

56,482.—TRUNK.—L. H. Wolff, Detroit, Mich.

I claim as a new article of manufacture intended for a cleat for a trunk, made of metal and constructed substantially in the manner above described.

56,483.—APPARATUS FOR APPLYING LIQUIDS TO CASKS.—James O. Woodruff, Albany, N. Y.

First, I claim the process for applying liquids to the interior of casks so as to penetrate into the pores of their bodies, by the employment of condensed air cold or at the temperature of the atmosphere, as described.

Second, The apparatus described in the within specification to effect the process of forcing liquids into the pores of cask bodies, that is, the frame, B, suspended on its axis, E, the disks, C, with their screw rods, R, the flexible tube, H, with its nozzle, J, and tube, k, substantially as described and for the purposes set forth.

56,484.—SPRING BED BOTTOM.—Joshua Barnes (assignor to Isaac A. Singer), New York City.

First, I claim in combinatian with a bed slat a wire spring having two parallel coils at the base and two parallel coils at the top, the coils at the base, C, turning adversely to those at the top, B, substantially as above described,

Second, In combination with the two adverse springs, I claim the hook or hinge, substantially as above described and for the purposes set forth.

Third, The combination of the cross bar, I, rod, E, pin, D, and slat, A, with the wire springs, as above described.

56,485.—MACHINE FOR MAKING CORDAGE, WEBBING, ETC.—James A. Bazin, Canton, Mass. (assignor to himself, A. B. Hall, West Roxbury, Mass.), C. Scott, and W. J. Town, Newton, Mass.

First, I claim, in a machine for making cordage, webbing, and other similar fabrics, so actuating the spools by mechanism, consisting essentially of the revolving platform, K, furnished with a series of gears, L M N, sliding plates, P, and recesses, O, in combination with the toothed ring, B, and a series of carriers, V, with their spool frames, that each stand will be carried around two stationary ones, and thereby form an interlocking twist, as set forth.

Second, I also claim the above-described mechanism in combination with the rack, W, for the purpose described.

Third, I also claim the sliding plates, P, operated by a cam wheel, Q, in combination with the platform, K, and a series of carriers, V, with their spool frames and spools, operating substantially as set forth.

Fourth, I also claim the combination of the gear, L, with its shaft, h, gears, S R, and cam wheel, Q, for operating the sliding plates, P, as described.

Fifth, I also claim adjusting the cam wheel, Q, by means of the eccentric pin, s, on the gear, R, as set forth.

56,486.—CASTER BOTTLE.—Burroughs Beach (West Meriden, Ct.), assignor to himself and E. A. Thorp, North Haven, Ct.

I claim the combination, with a caster bottle, of a shaft or spindle extending through the same in the direction of its length, and arranged to be turned therein in the manner and for the purpose described.

56,487.—QUARTZ MILL.—Smith W. Bullock, Elizabeth, N. J., assignor to the Bullock Ore Dressing Machine Company, New York City. Antedated July 3, 1866.

I claim, First, the combination of the rotating trough, D, with the crushing wheels, G G, and gear wheels, E and F, so as to govern the rotary motion of the trough while its vertical action is independent of, and disconnected from, the gear wheels.

Second, I claim the application of springs to the adjustable bed, so arranged as to form a binding link or tie between the supports of the crushing wheels, G G, and the supports of the trough, D, each of the several features being arranged and operating substantially as and for the purposes herein set forth.

56,488.—BOILER FOR COOKING STOVE.—Esek Bussey, (assignor to himself and Chas. A. McLeod), Troy N. Y.

First, I claim a water reservoir, or tank, constructed of cast

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iron, and entirely covered or coated upon the inner and outer surfaces thereof by zinc, or an alloy of zinc, substantially as aforesaid, in combination with a cooking stove, in the manner substantially as herein described and set forth.

Second, I claim the water reservoir or tank for cooking stoves, constructed entirely of cast iron and then covered or coated upon the inner and outer surfaces with zinc, or an alloy of zinc and tin, in the manner, and by the means, and for the purposes, substantially as herein described and set forth.

56,489.—Machine for Filling Cartridges.—Wm. C. Dodge and R. D. O. Smith (assignors to W. C. Dodge and W. S. King) Washington, D. C.

We claim, First, A machine for filling cartridges, in which the powder is entirely inclosed during the operation.

Second, A series of measuring tubes, so arranged that they can be adjusted to contain a greater or less quantity, at will, substantially as described.

Third, The combination and arrangement of the lever, P, for operating the slides with springs of different tension, for causing the slides to operate alternately, with a single movement of the lever, substantially as and for the purpose set forth.

Fourth, The auxiliary charger, C, arranged in relation to the hopper bottom, B, and the tubes, Y, and operating in connection therewith, substantially as described.

Fifth, The bars, a, or their equivalents, arranged over the openings, b, of the hopper bottom, substantially as and for the purpose set forth.

Sixth, Providing the slide, C, with the raised rim, n, with or without the spring, r, as shown and described.

Seventh, The combination of adjusting devices, for regulating the charge, with the index lever, s, and graduated plate, T, as and for the purpose set forth.

Eighth, The slide, H, provided with cells for receiving the cartridge cases, substantially as described.

Ninth, The drawer, G', in combination with the cover, I', provided with the tubes, t, arranged to operate as and for the purpose set forth.

Tenth, The frame or guide, M, for inserting the cases in the cells of the drawer, G', substantially as described.

56,490.—Screen for Gas Purifier.—Edward Duffee (assignor to himself and Geo. A. Kimball), Haverhill, Mass.

I claim constructing screens for dry coal gas purifiers of strips of thin wood, crossing each other, and either riveted together or interlaced in the form of basket work, supported by a framework of metal, or its equivalent.

56,491.—Draw Bridge Signal.—Luther B. Edgecomb (assignor to himself and Van Rensselaer Powell) Troy, N. Y.

First, I claim the combination of a rack, a, a pinion, b, and a swinging or adjustable signal bearer, g, or their equivalent operating devices, with a drawbridge, in the manner substantially as shown, and for the purpose of operating the signals of draw bridges in the manner as described.

Second, I claim the combination of a spring, d, and a stop, f, with a pinion, b, with its stud, e, and a signal bearer, g, in the manner substantially as shown and for the purpose set forth.

Third, I claim the combination of the swinging or adjustable signal bearers g and i, with the yokes or double transmitting arms, k and k', connected by means of ropes or wires, l l, in the manner substantially and for the purpose as shown.

Fourth, I claim the combination of a signal and its swinging or adjustable bearer, i, and the double transmitting arms or yokes, k' and k2, with each other, and with the double arms or yoke, k3, and its adjustable signal bearer, m, arranged relatively to, and in the manner substantially as described, and for the purpose set forth.

56,492.—Machine for Trimming Percussion Caps.—James H. Fowler and A. J. French (assignor to the American Flask and Cap Company), Waterbury, Conn.

First, We claim the feed plate C (one or more), provided with a series of feed holes, h, which are arranged in curved lines to correspond to the position of the holes, b, in the conveyor, B, and operating in combination with said conveyor, substantially as and for the purpose described.

Second, The revolving conveyor, B, in combination with the plunger, b', trimming dies, E, and knife, F, constructed and operating substantially as and for the purpose set forth.

Third, The supporting plate, D, and spring, f', in combination with the conveyor, B, constructed and operating substantially as and for the purpose described.

Fourth, The stationary bracket, h', and pin, g', in combination with the spring, f', supporting plate, D, and conveyor, B, constructed and operating substantially as and for the purpose set forth.

Fifth, The reciprocating slide, c, and dog, c*, in combination with the supporting plate, D, and conveyor, B, constructed and operating substantially as and for the purpose described.

Sixth, The revolving trimming dies, E, and clamping spring, n*, in combination with the reciprocating knife, F, constructed and operating substantially as and for the purpose set forth.

Seventh, Giving to the cutting edge of the trimming knife an upwardly inclined position, substantially as and for the purpose described.

56,493.—Looms for Weaving Slat Blinds.—Martin Free (assignor to Alfred Louderback) Philadelphia, Pa.

First, I claim the application to a slat blind loom of the slat feeding device, D d' d4, the same being constructed, arranged, and operated substantially as and for the purpose described.

Second, I also claim the employment or use in a slat blind loom of either or both of the automatically acting cutters E E', the same being applied so as to operate substantially as and for the purpose described.

56,494.—Machine for Securing Strips of Sheet Metal together.—W. J. Gordon (assignor to J. S. Mason & Co.), Philadelphia, Pa.

First, I claim the roller, H, with its flange, c, in combination with the disk, F, and its lugs, a a', the whole being arranged for joint action, substantially as and for the purpose described.

Second, The detachable disk, G, with its flange, b, in combination with the disk, F.

56,495.—Making Gear Cutters.—Lewis F. Grant, Thomaston, Conn. assignor to himself, Joseph R. Brown, and Lucien Sharpe, Providence, R. I.

I claim forming the blades of cutters for gear cutting with the tools and in the manner substantially as described.

56,496.—Machine for Molding Materials Admitting of Cohesion.—John Greacen, Jr., and Ambrose Foster, New York, and John H. Cooper, Philadelphia, Pa. assignors to the American Building Block Company, New York.

First, We claim the use, in combination with a machine constructed substantially as described, of two or more cylinders and pistons connected to separate operating parts of the machine and operating in unison, substantially as and for the purpose specified.

Second, The use, in combination with the above described machine, of cylinders having openings, c, arranged in respect to and communicating with the exhaust ports, substantially as and for the purpose set forth.

Third, The combination of the reciprocating feed box, J, and its opening, n, with the sharpened edge, z, for the purpose described.

Fourth, The combination of the mold box and anvil so adapted to each other that the former can descend while the anvil and formed block remain stationary, for the purpose explained.

Fifth, The combination of the mold box, I, connecting rod, R, arm, Q, and shaft, M', the whole being arranged and operating substantially as and for the purpose herein set forth.

Sixth, The spring, T, or its equivalent, interposed between the mold box and any stationary part of the machine, and operating as and for the purpose herein set forth.

56,497.—Lamp.—Bertrand J. Hoffacker (assignor to himself and August W. Steinhaus) New York.

First, I claim the improved lamp, consisting of the oil-well or base, A, movable neck, C, chimney stay, D E, and glass tube, G, in combination with the usual parts of a lamp, substantially as described.

Second, The glass tube, G, containing a wire, g, filled on ends with cotton and in the middle with bone dust or equivalent, substantially as described.

Third, The mantle, J, of the wick holder, n, capable of being raised or lowered by means of the forked lever, H, substantially as described.

56,498.—Stamp Canceling Press.—Francis Hovey (assignor to himself and Charles H. Clayton) New York.

I claim the hollow screw, C, in combination with the central stem, e, plunger and frame of a cancelling stamp or press, substantially as herein set forth for the purpose specified.

56,499.—Trunk.—Luther Jackson, Newark, N. J. (assignor to Edgar Farmer and William H. Cleveland, New York).

First, I claim the spring stops or braces, B, in combination with the inside cover, C, of a trunk constructed and operating substantially as and for the purpose described.

Second, The bellows-shaped or expanding tray or cover, C, in combination with the trunk, A, constructed and operating substantially as and for the purpose set forth.

56,500.—Valves for Relieving Steam Cylinders of Water.—Charles W. Kimball and Mary E. Norcott, of Springfield, Mass., administratrix of the estate of W. J. Norcott, deceased.

Claim the combination of the valves, P P, and the rod, A, formed as described with the cylinder of a steam engine, and suitable mechanism for operating the same, substantially in the manner and for the purpose herein set forth.

56,501.—Umbrella.—George B. Lego (assignor to David K. Brown) New Haven, Conn.

I claim an umbrella having the handle in two sections connected by a sleeve and attachment, substantially as described.

56,502.—Boring Wells and Laying Pipes.—D. B. Tiffany (assignor to himself and Robert E. Richardson) Xenia, Ohio.

I claim the boring tube, D, in combination with the tubular screw, C, and nut, B, arranged to operate in the manner and for the purpose set forth.

In combination with the tubular screw, C, and rod, D, I claim the adjustable ring, e, as shown and described.

56,503.—Apparatus for Carbureting Gas.—William M. Wright (assignor to himself and James E. Pilkington) Baltimore, Md.

I claim the use of division plates covered with cloth or its equivalent material, with their openings, notches, and adjustment in an inclosed box,, so to form a continuous air-tight chamber when the lower part of the box is charged with a fluid, as and for the purpose described.

I claim the use of the flat tube or its equivalent arrangement for preventing the heavier portions of the fluid, hydro-carbon, from remaining at the bottom of the box, thereby securing a uniform volatility from all the fluid till it is consumed, as and for the purpose described.

I claim a combination of division plates, openings, notches, cloth coverings, and flat tube in an inclosed box, substantially as and for the purpose described.

56,504.—Method of Manufacturing Tiles, &c.—William Boulton and Joseph Worthington (assignors to Malkin & Co.), Burslem, England.

We claim the improved mode and arrangement of apparatus for forming encaustic tiles, slabs, and other articles, substantially as above described and represented in the accompanying drawings.

56,505.—Manufacture of Acetate of Lead.—Jules Edmond Fournier, Courville, France.

I claim, first, The direct manufacture of acetate of lead or salt of saturn by the process herein described, that is to say, by means of pyroligneous acid distilled or saturated with lime and decomposed by sulphuric or muriatic acid, then saturated with lead or its derivatives evaporated, crystallized, pressed, or submitted to the action of a turbine, and finally redissolved, evaporated, decolorized, clarified, and recrystallized.

Second, In the process of manufacturing acetate of lead, as described, I claim specially the employment of the turbine or press as and for the purposes herein set forth.

56,506.—Adjustable Stock of Fire-arm.—Chas. William Jones, Cheltenham, England.

First, I claim dividing the but of the arm in such manner and so combining and connecting the parts together by suitable mechanism that a double and simultaneous motion of the parts of the but is obtained at will. The one action causing an extension of the heel, straightening the stock, and thus allowing the but to rest against the shoulder, the other motion extending a cheek piece to form an efficient rest for the cheek in the altered form of the but, in the manner more fully described herein and illustrated in figures 1 and 2.

Second, I claim the lever arm, p, designed to receive an orthoptic or telescopic back-sight.

56,507.—Silvering Mirrors.—Rudolph Heck (assignor to F. W. Wood, Solon D. Stanbro, Josiah Warren, and Julius H. Royce) Chicago, Ill.

I claim the method of precipitating upon glass plates nitrate of silver, or other suitable substance or substances by means substantially such as herein described, or any other equivalent means.

56,508.—Storing Hydro-carbon Liquids and Other Materials.—P. C. P. L. Prefontaine, Paris, France.

I claim the system of warehousing, as herein described, by immersing in water any number of vessels or receptacles of any form or dimensions hermetically sealed and joined together, arranged in combined or separate series, strengthened and held together as herein described, and covered either by a roof or by planking on the top and around the sides, as described, the said system being adapted and fitted for the warehousing of all liquids and other substances.

REISSUES.

2,313.—Steam Gage.—Ralph Allen, Rock Stream, N. Y., assignee of Albert J. Allen, Buffalo, N. Y. Patented Oct. 4, 1859.

First, I claim the improved pressure gage, herein described, consisting of the following parts: 1st, the within-described elastic capsule having faces formed of sheet metal neither convex nor concave, to be connected with the boiler, to receive and be expanded by the pressure of the steam; and 2d, multiplying levers and index, the whole being so arranged as to render available the elasticity of two opposite faces of said capsule at the same time in operating the index through the medium of delicately-operating levers, substantially as and for the purpose herein set forth.

Second, I claim mounting such capsule in combination with the other parts so that the steam is admitted at the center of one of the said faces or ends, substantially as and for the purpose herein specified.

Third, I claim the employment of the capsule, G, of peculiar construction, having the steam admitted at one side and through the center of that side, and using the flexibility of both sides (such capsule being made of a permanently-elastic metal and not injuriously oxidized by steam or water, preferring for that purpose the metal used in making melodeon reeds), in combination with fulcrum block, F, lever, H, spring, P, rod, O, rod, I, swivel block, J, radius bar, L, and segment, K, having tail piece, k, pinion, N, index pointer, E, dial plate, D, and friction-pressure spring, M, substantially as shown and described.

Fourth, I claim radius bar, L, in combination with rod, I, swivel block, J, segment, K, having tail piece, k, pinion, N, index pointer, E, and dial plate, D, having increasing divisions on its face, substantially as shown and described.

2,314.—Car Spring.—T. F. Allyn, Canandaigua, N. Y. Patented June 20, 1865. Antedated March 28, 1865.

I claim the construction of a metallic car spring of rectangular, rhombic or other equivalent-shaped plates, which plates are curved diagonally, and have central and end or corner bearings and fastenings, substantially as and for the purpose set forth.

2,315.—Hay Press.—Levi Dederick, Albany, N. Y. Patented July 14, 1863.

I claim in the above-described press the use of two toggle levers placed at opposite sides of the press box, in combination with links having their fixed ends located at or near the bottom of the frame, so the upper ends of the levers will move up on the outside of the press box in pressing a bale.

I claim the use of toggle levers in combination with a suspended follower.

I claim suspending the follower to the upper ends of the levers through the perpendicular slots or openings in the sides of the press box.

I claim the rigid bracket connections or their equivalents, in combination with the ends of the follower timbers projecting through the slots in the sides of the press, in the manner and for the purpose substantially as described.

2,316.—Process for Distilling Rock Oil and Other Hydrocarbons.—E. F. Prentiss and R. A. Robertson, Philadelphia, Pa., by their assignees, W. D. Philbrick and W. J. Parsons, Boston, Mass. Patented March 8, 1864. Antedated July 31, 1862.

First, We claim drawing off the residuum during the process of distillation from a steam-heated still, substantially as described.

Second, We claim feeding crude oil into the still through one or more condensers so that the crude oil serves as a surface-condensing bath to the oil vapor coming from the still, and at the same time the crude oil itself undergoes a separate, partial distillation before reaching the main still.

Third, We claim simultaneous fractional-surface condensation by means of crude oil on its way to the still.

Fourth, We claim the employment of superheated steam for maintaining a series of baths at graduated temperatures, in carrying on the process of fractional distillation, substantially as described.

2,317.—Apparatus for Distilling Rock Oil and Other Hydrocarbons.—E. F. Prentiss and R. A. Robertson, Philadelphia, Pa., by their assignees W. D. Philbrick and W. J. Parsons, Boston, Mass. Patented March 8, 1864. Antedated July 31, 1862.

We claim, First, The combination of the still, A, the injecting worm, a v. a v. a v i. a v i i., and the central tube, G G' G''.

Second, Roughening the surface of the injecting worm or tube, a v. a v i. a v i i., to render the ebullition regular and quiet.

Third, The combination of the still, A, with the series of columns, two or more, each column being set and maintained at the temperature necessary to separate the product condensable at such temperature, whereby at one continuous operation the crude oil is separated into the various products due to condensation at the different temperatures fixed upon.

Fourth, The arrangement of the vapor tubes and oil spaces in columns, B B'', or C C'', whereby the crude oil on its way to supply the still, A, is made to act as a condensing bath to the vapors in these columns, coming from the still, A.

Fifth, The arrangement of the columns, B B''', and C C''', in combination with the still, A, and the movable exit tube, g'', whereby the operation of the still is rendered continuous.

Sixth, The air regulator, or its equivalent, for regulating the temperature of the respective columns, or either of them, in combination with the pipes of supply of the heating and cooling media.

Seventh, The water legs, X, and the floats, Z, for regulating the escape of water from the columns.

Eighth, The auxiliary heads, V V', for enabling the oil bath in each column to act as a still.

Ninth, The warming of the bottoms of the chambers which are the bases of the columns, by means of steam chambers, arranged and operating as shown.

Tenth, The warming of the bottom of the column on which the still, A, is supported, substantially as above described.

Eleventh, The arrangement of the column, B B''', so as to act immediately as a still to C C''', and the column, C C''', so to act as a still to D D''', and so on if crude oil is fed into the main still through more than two columns.

Twelfth, The arrangement of the oil spaces in B B''', and C C''', in combination with the still, A, whereby the operation of the still is made continuous, and the fresh oil is introduced at a high temperature into the still, A.

2,318.—Reaping Machine.—David Wolf, Lebanon, Pa. Patented January 31, 1865.

I claim a platform for reapers, constructed in such a manner that it may either automatically, or at the will of the driver or attendant, be made to tilt on a sliding axis arranged parallel with the finger bar, or nearly so, and by said movement throw or discharge the cut grain from it, substantially as set forth.

I also claim the constructing of the platform of two or more parts connected by a joint or joints and arranged to operate in the manner substantially as described.

I further claim the arrangement of the crank, G, and springs, c d, substantially as described, for operating the platform.

DESIGNS.

2,356 and 2,357.—Paper Cuffs.—B. G. Briggs, (assignor to himself, J. A. Hanley, and T. Hilton) Providence, R. I. Two Cases.

2,358.—Paper Collar.—B. G. Briggs (assignor to himself, J. A. Hanley, and T. Hilton,) Providence, R. I.

2,359 and 2,360.—Clock Case.—F. F. Fracker, Boston, Mass. Two Cases.

2,361.—Stove.—John Martins, Jacob Beesley, and John Currie (assignors to Lake, Beader & Co.), Philadelphia, Pa.

2,362.—Door of a Clock Case.—Noah Pomeroy, Hartford, Ct.

2,363.—Burial Casket.—Wm. W. Roberts, Hartford, Ct.

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AMESSIEURS LES INVENTEURS—AVIS important. Les inventeurs non familiers avec la langue Anglaise, et qui prefereraient nous communiquer leurs inventions en Français peuvent nous addresser dans leur langue natale. Envoyez nous un dessin et une description concise pour notre examen. Toutes communication seront reçues en confidence.
MUNN & CO.,
Scientific American Office, No. 37 Park Row, New Yo

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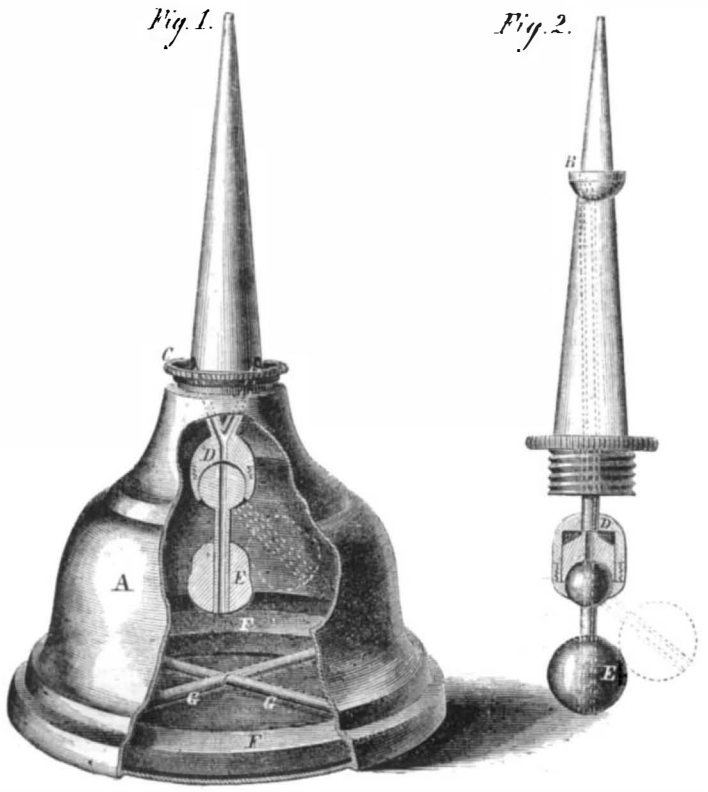
Improved Oiler for Machinery.

The overflow of oil in the common can, and the difficulty of keeping the outside clean and free from grease, make it a source of much annoyance when used on nice machinery, or about sewing machines, and machinery for weaving such fabrics as silk and other delicate goods. In using the oiler with the greatest care, a minute drop of oil will be left at the top of the tube and will find its way to the outside of the can. The illustration represents an improvement intended to obviate these difficulties.



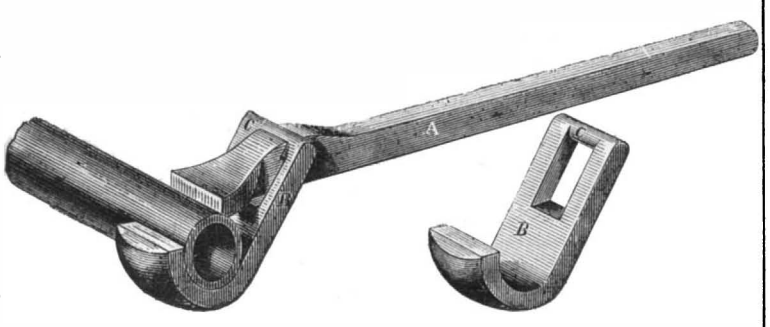
HOLT & THOMPSON'S IMPROVED OILER.

A represents an oiler, which may be of any convenient form and proper material. A small pipe projects from the delivery tube down into the oil, and is furnished with one or two branches extending upward to a cup, B, surrounding the tube, or to the top of the screw flange, C, which is made concave. The lower end is provided with a globe valve, D, which contains a hollow sphere, through which a pipe runs and debouches at the bottom of the weight, E. When the can is erect these pipes are all in line, admitting the air through the apertures in the tube to the oil, and allowing whatever oil is left, after using the can, to find its way back to the interior. When the oiler is canted for use, the connection between the oil in the interior and the orifices at the side of the tube is broken (see dotted lines), so that no oil can pass out except through the top of the tube. At the bottom is a ring, F, of lead, or some heavy metal, which gives security to the base, and the bars, G, which extend across it from side to side, prevent the spring of the bottom from setting. The valve is put together with a screw thread, and the parts can be readily removed for cleaning. This device can be applied to any ordinary oiler at a small expense.

Patented April 24, 1866. For further information address J. M. Thompson, 2d, or G. L. Holt, Box 1,058, Springfield, Mass.

Improved Gas-pipe Tongs.

Pipe tongs are now universally used, not only for the work of the gas-fitter, but for many purposes in the shop and the manufactory, and about oil wells. For almost every differing size of pipe, or shaft, another and separate instrument must be provided. Of course, the common tongs are costly. The improvement represented in the engraving is designed to afford a cheaper tool, and one that can be easily adjusted to different sizes of pipe. Its construction and operation can be plainly seen by the illustration.



BANNISTER'S GAS-PIPE TONGS.

A is the handle, or lever, with edge to gripe the pipe, and having a jaw, B, entirely disconnected, but resting in a recess in the lever, by the spade-handle joint, C. The location of the notch in the lever and the length of the hook jaw are such that when the pipe is engaged the edge of the lever touches the pipe at a point insuring a hold and preventing slipping. The ease with which the hook, B, may be disengaged from the lever, A, and other sizes substituted, and the facility with which alterations of size and form may be made, show peculiar advantages for this device.

Patented May 1, 1866. Those desirous of purchasing the tongs or right to manufacture, will please address John H. Cooper, People's Works, corner Front street and Girard avenue, Philadelphia, Pa.

Resin in Collodion.

BY WM. ENGLAND.

In as few words as possible I will give you the mode of working which, in my hands, has produced the best and most certain results. Prepare the collodion by adding to ordinary bromo-iodized collodion two grains of bromide of cadmium and two grains and a half of common resin to each ounce of collodion. It will readily dissolve by shaking the bottle a few times. Allow this to stand an hour or two, and, when required, coat the plate and sensitize in a bath prepared in the ordinary way, and containing a full amount of silver (say forty grains to the ounce) and about four drops of nitric acid to each pint of solution. The plate should stay in the bath not less than five minutes. After its removal, wash the plate moderately well, for about half a minute, under a gentle stream of common water, and finally with a little distilled water. The plate may now be placed to dry spontaneously or by gentle heat. No preservative being required, one of the difficulties and uncertainties of dry plate photography is left out. The time of exposure in the camera may be very readily determined by one or two experiments. It should not exceed double that of wet plates. Before developing, it is advisable to run a little varnish round the edges of the plate with a camel-hair pencil, or the film is apt to get loose. Slightly wash the dry plate, and pour over it the ordinary iron solution, letting it well penetrate the film. Pour off into the measure, and add two or three drops of a 30-grain solution of silver. Proceed again with the development, and the picture will make its appearance almost as rapidly as a wet plate. Viewing it by transmitted light, the details should all be well out ere washing off and proceeding to intensify with pyrogallic acid; or, should it be found that the plate has been rather under-exposed, the first developmen may be continued by the gelatino-iron solution, after as much detail as possible has been brought out by the ordinary iron. In fact this mode of development enables one to give very short exposures. Ten seconds I have found quite sufficient for a portrait in a glass room with moderate light. The fixing may be done with either cyanide or hypo, in the usual way.

Now a word or two on the subject of the bath. See that it is in good condition by trying a wet plate before preparing the dry, or failure will be the result. After having passed two or three dozen plates through the bath, it may show signs of fogging; therefore, after each batch of plates is prepared, a few drops of ammonia, or solution of carbonate of soda, and a few drops of a solution of cyanide of potassium, should be added, and the bath placed in the sun till wanted again, when, after filtering and adding a few drops of nitric acid (just sufficient to make it slightly acid), it will again be found to work perfectly. This method may be adopted from time to time as may be found necessary. Where a large number of plates is required, two baths may be used, so as to have one or the other continually exposed to the sun. This "doctoring" of the bath may be thought very troublesome, but in practice I have not found it so. Probably Mr. Cooper, who has already worked with resins, or some other experimentalist, may discover some substance which may give the necessary qualities to the collodion without exercising a baneful effect upon the bath. The whole of the resins I have tried—such as amber in chloroform, mastic, copal, Canada balsam, guaiacum, etc., have all the same effect, both on the bath and the results obtained. No doubt they act mechanically in breaking up the structure of the film and giving it the necessary qualities to receive the developer.—*Photographic News.*

Patents in Canada.

A few days since we wrote to Canada for information in regard to the proposed change in the Provincial patent laws, and have received the following from Mr Tache, Superintendent of the Bureau of Agriculture, at Ottawa:—

"I am in receipt of your letter, and all I can say in reply is, that the Government have officially intimated their intention, during the debates of the Legislative Assembly, not to alter the existing patent law on account of Confederation being so close, although they have made up their mind that alterations must be made in the said law as soon as possible; the reason for further delay obviously being that the Sister Provinces are to have their voice in such alteration.

MECHANICS

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